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ABSTRACT

The physical facilities of 700 colleges and universities of the United States were studied by the National Center for Education Statistics in the fall of 1977. The primary study objectives were to: (1) develop a reliable estimate of what American colleges and universities must spend to make their programs accessible to the mobility impaired, as required by Section 504 of the Rehabilitation Act of 1973; and (2) examine the relationship between physical plant accessibility and program accessibility. Information is presented on the current state of physical accessibility on American campuses and the way in which they will modify their space to achieve program accessibility. A detailed analysis of the cost implications is included, as are floor plans and architectural modification specifications. Estimates of the numbers and enrollment patterns of various groups of handicapped are presented. The ability of institutions of higher education to house these students is also discussed. Two technical chapters are included that discuss the methodology employed in the study and assess the quality of the data presented in the report. Limitations of the scope of the study are also covered. The final chapter describes how well institutions understand the impact of Section 504. Appendices include a sample survey instrument, site visit survey forms, and a study workbook. (SW)

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THE IMPACT OF SECTION 504

of the Rehabilitation Act of 1973 on American Colleges and Universities

ED184391

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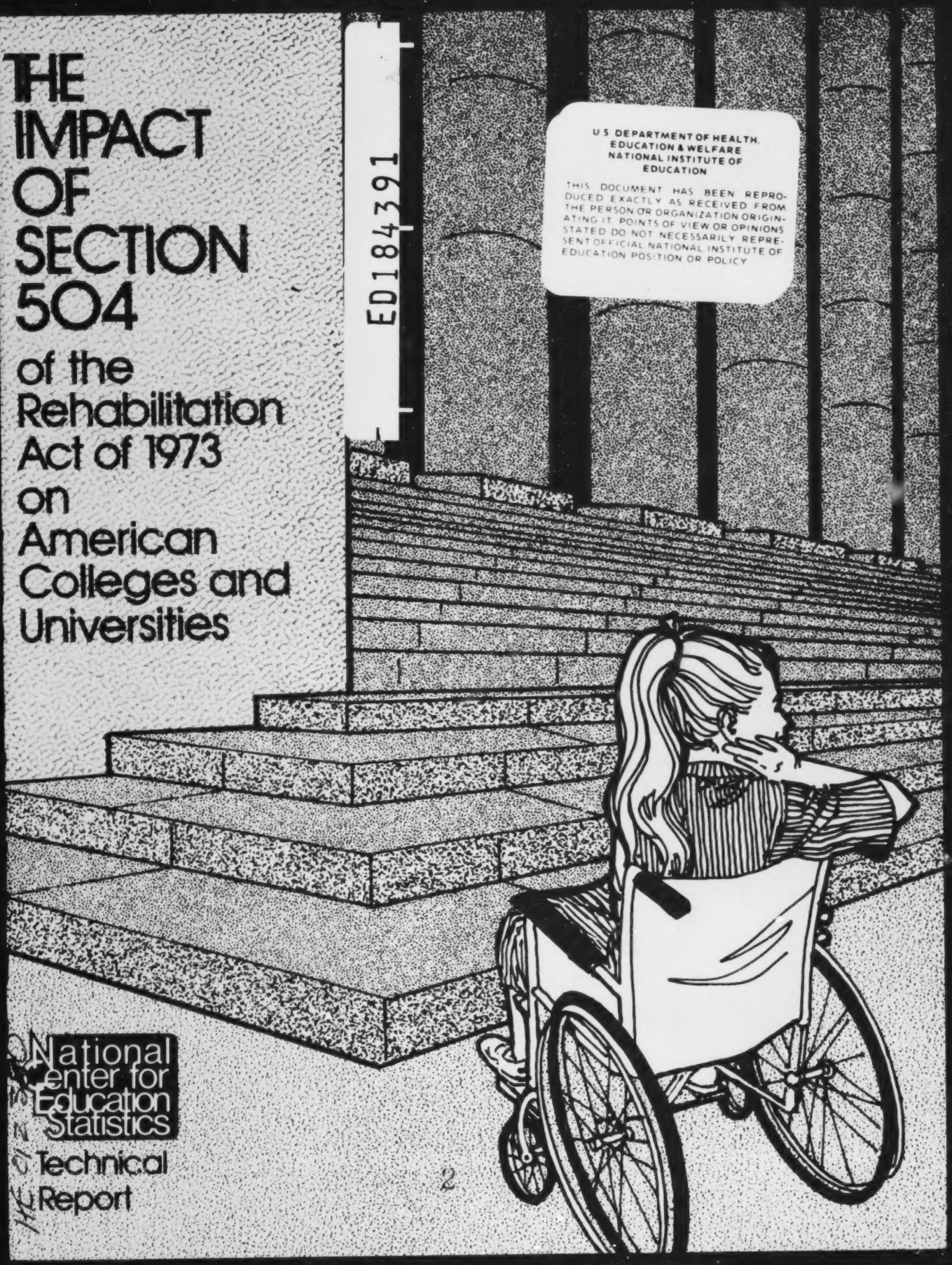

National Center for Education Statistics

Technical Report

THE IMPACT OF SECTION 504

of the Rehabilitation Act of 1973 on American Colleges and Universities

Technical Report

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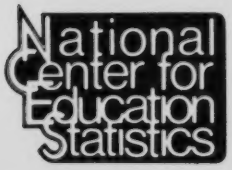

National Center for Education Statistics

"The purpose of the Center shall be to collect and disseminate statistics and other data related to education in the United States and in other nations. The Center shall . . . collect, collate, and, from time to time, report full and complete statistics on the conditions of education in the United States; conduct and publish reports on specialized analyses of the meaning and significance of such statistics; . . . and review and report on education activities in foreign countries."--Section 406(b) of the General Education Provisions Act, as amended (20 U.S.C. 1221e-1).

Foreword

In fall 1977, the Office for Civil Rights of the Department of Health, Education, and Welfare requested that the National Center for Education Statistics (NCES) study the physical facilities of 700 colleges and universities nationwide. The primary objectives of the study were (1) to develop a reliable estimate of what American colleges and universities must spend to make their programs accessible to the mobility impaired (a Section 504 requirement); and (2) to examine the relationship between physical plant accessibility and program accessibility. The purpose of this publication is to report the findings of that study.

An introductory chapter is followed by a chapter discussing the limitations of the scope of this study. The next two chapters present the findings of the study. The first of these chapters reports the current state of physical accessibility on American campuses and the way in which they will modify their space to achieve program accessibility. Included is a detailed analysis of the cost implications. The other chapter provides estimates of the numbers and enrollment patterns of various groups of handicapped students. It also discusses the ability of institutions of higher education to house these students. Two technical chapters are provided which discuss the methodology employed in the NCES study and access the quality of the data presented in this report. The final chapter describes how well institutions understand the impact of Section 504.

NCES hopes the results of the study presented in this report will help further the understanding of the impact of Section 504. We particularly hope the study will clarify the types of structural modifications the institutions must make to allow the Nation's handicapped greater access to higher education.

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Chief
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June 1979

Acknowledgments

We wish to acknowledge those organizations and individuals who contributed significantly to the study. The contractor was Higher Education Facilities, Incorporated; Charles Wheeler, Executive Director; Thomas Heath, Project Director. Consultants on the project included Richard Anderson, Association of Physical Plant Administrators of Universities and Colleges; Steven Cotler, Barrier Free Design Coordinator, New York State University Construction Fund; Richard Stephan, independent training consultant; and James Bennett, Special Assistant to the Deputy Director, Office for Civil Rights.

Many individuals from NCES made significant contributions to the study. More notable are: Arthur Podolsky, statistician, who served as interim project officer for several months; Abraham Frankel, mathematical statistician, who developed and monitored the sample design; Lucille Hall, statistical assistant, who did much of the checking of the tables; Lance Ferderer, writer/editor, who corrected the manuscript and designed the format; and Phil Carr, graphics artist, who designed the cover and photo layouts.

Other persons provided significant help. We wish to thank the 72 persons who were trained in the audit methodology and the 120 individuals who performed the on-site evaluations. The names of these individuals are listed in appendix E. A special appreciation is extended to the college administrators who supplied the data and voluntarily cooperated in responding to the questionnaire and the on-site visits.

We would also like to thank the Association of Physical Plant Administrators of Universities and Colleges—and the institutions involved—for providing the photos in this report.

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Information about the Center's statistical program and a catalog of NCES publications may be obtained from the Statistical Information Office, National Center for Education Statistics, Room 3055, 400 Maryland Ave. SW., Washington, D.C. 20202, telephone (202) 472-6237.

Inquiries for survey forms and for related computer products, including computer tapes, online access to data, printouts, and microfiche should be directed to Data Systems Branch, National Center for Education Statistics, Room 3033, 400 Maryland Ave. SW., Washington, D.C. 20202, telephone (202) 245-8750.

Contents

Page

Foreword iii

Acknowledgments v

For More Information vi

Highlights xi

Introduction 1

Limits of the NCES Study 3

Accessibility–Its Cost and Character 5

Higher Education and the Handicapped Today . . . 33

Methodology 41

Quality of the Data 49

Institutional Understanding of Section 504's Impact 57

Appendixes

A. Reproduction of the Cover Letter and Survey Instrument 61

B. Site Visit Survey Forms 71

C. Study Workbook 97

D. List of Persons Consulted in the Development of the Survey Instrument 137

E. List of Auditors Trained and Site Visit Teams 139

F. Regional Distribution of States 142

Charts

1. Physical accessibility of American colleges and universities, by control of institution 6

2. Percent distribution of public and private institutions, by type of institution 8

3. Physical accessibility of universities, by control and region 9

4. Accessibility profile of universities, by room-use category 10

5. Physical accessibility of other 4-year institutions, by control and region 11

6. Accessibility profile of other 4-year institutions, by room-use category 12

7. Physical accessibility of 2-year institutions, by control and region 14

8. Accessibility profile of 2-year institutions, by room-use category 15

9. Representation of handicapped individuals in the population and in higher education 34

10. Enrollment patterns of mobility impaired, visually impaired and acoustically impaired individuals, by control and type of institution . . . 35

11. Enrollment patterns of mobility impaired, visually impaired and acoustically impaired individuals, by region of institution 36

12. Distribution of gross area, by year of construction for space constructed before 1975 55

Text Tables

A. Cost per assignable square foot (ASF) of space, by size of institution 7

B. Number of institutions in the survey sample, by control and type 44

C. Distribution of the sample for stage two 45

D. Effect of nonresponse, by control and type of institution 54

E. Total assignable space constructed before 1975, by control and type of institution 54

F. Total assignable space as a percent of total gross area for space constructed before 1975, by control and type of institution 56

Reference Tables

1. Cost per assignable square foot (ASF) of space and average size, by control, type and region of institution 16

2. Cost per full-time equivalent (FTE) enrollment, by control and type of institution 19

3. Percent of institutions in selected cost brackets, by control and type 19

4. Total inaccessible space, percent to be modified, and cost per square foot, by year of construction of facility and control of institution 20

5. Space inventory of college and university physical facilities and associated costs for achieving program accessibility for the mobility impaired, by control and type of institution 21

6. Assignable space constructed before 1931 which must be made accessible as a percent of total assignable space, by control, type and region of institution 25

7. Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control and type of institution 26

8. Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control, type and region of institution 27

9. Number and percent of mobility impaired, visually impaired and acoustically impaired individuals enrolled in fall 1978, by control and type of institution 37

10. Number of mobility impaired, visually impaired and acoustically impaired individuals enrolled in institutions of higher education in fall 1978, by control, type and region of institution . . . 38

11. Ability of institutions of higher education to house mobility impaired students currently enrolled, by control and type of institution . . . 40

12. Sample sizes and response rates for the two stages of the NCES study 50

13. Coefficients of variation for total cost associated with Section 504, by control, type and region of institution 51

14. Coefficients of variation for numbers of mobility impaired individuals enrolled in institutions of higher education in fall 1978, by control, type and region of institution 51

15. Coefficients of variation for numbers of visually impaired individuals enrolled in institutions of higher education in fall 1978, by control, type and region of institution 52

16. Coefficients of variation for numbers of acoustically impaired individuals enrolled in institutions of higher education in fall 1978, by control, type and region of institution 52

17. Currently accessible space and accessible space needed for program accessibility, by control and type of institution 58

Highlights

- The estimated capital cost to the Nation's colleges and universities to make their programs accessible to the mobility impaired is $561 million.

- Just over 40 percent of the total assignable space on college and university campuses is currently accessible; an average of over 75 percent is needed for program accessibility. Private 2- and 4-year institutions report only about 20 percent of their assignable space currently accessible.

- The impact of Section 504, measured by cost per assignable square foot of space, is greater for private 2- and 4-year institutions than for private universities and all public institutions.

- Renovation costs increase with the age of the building to be modified from an average cost of $.34 per assignable square foot for buildings constructed since 1975 to an average of $2.51 for space constructed prior to 1900.

- Where there is a choice, institutions are planning to modify newer buildings rather than incur the greater costs of renovating older facilities. The average cost of renovation decreases with the size of the campus. Cost for campuses of over 5 million assignable square feet is $.30 per square foot and increases to $.82 per square foot for campuses with less than 100,000 assignable square feet of space.

- In general, the colleges and universities have:
  - properly assessed how much of their space must be accessible to the mobility impaired to achieve program accessibility
  - overestimated the amount of space currently accessible
  - underestimated the space required to be modified for compliance
  - overestimated the cost to modify their facilities

Introduction

Lane Community College, Eugene, Oregon

In order to ensure that the Nation's handicapped persons may participate fully in society, Congress passed the Rehabilitation Act of 1973. Section 504 of that Act (P.L. 93-112) provides that "no otherwise qualified handicapped individual in the United States . . . shall, solely by reason of his handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

The regulations implementing Section 504 (published in the *Federal Register* on May 4, 1977) delineate the methods by which college and university recipients could comply with the requirements of program accessibility. In the case of existing facilities, program accessibility can be achieved "through such means as redesign of equipment, reassignment of classes or other services to accessible buildings, assignment of aides to beneficiaries . . . alteration of existing facilities and construction of new facilities," among other methods. Program accessibility is, therefore, the key term in implementing Section 504. In effect, it means that all activities or "programs" available to any enrollee must, if at all possible, be accessible to handicapped persons. These programs extend beyond academic programs and include services to students provided in the life styles on campus—in recreational, social, eating and living areas, and so forth.

Institutions are given until June 1980 to complete all architectural modifications. The regulations carefully emphasize that recipients are not required to make structural changes in existing facilities where other methods are effective in achieving compliance. Facilities do *not* need to be "barrier free."

The responsibility for enforcing the provisions of Section 504 was vested in the Director of the Office for Civil Rights (OCR) of the Department of Health, Education, and Welfare. To do this with one group of recipients—colleges and universities—OCR discussed with the National Center for Education Statistics (NCES) in late spring of 1977 the possibility of NCES's modifying its periodic facilities inventory. The inventory would thus serve as a vehicle for "targeting" institutions for compliance visits. Accessibility of physical facilities does not equal program accessibility as required by Section 504. Still, OCR and NCES agreed that the former was sufficiently related to the latter to use it as a surrogate measure.

While the initial agreement did not stipulate that NCES would collect cost data, the cost to recipients of complying with Section 504 requirements was, and con-

tinues to be, a major issue. An economic impact statement[1] prepared for OCR in early May 1977 estimated that the *total* cost of physical plant renovations required by Section 504 would fall between $299 million and $544 million for all types of institutions. For colleges and universities, the estimate ranged from $117 million and $261 million. The American Council on Education responded that the costs for colleges and universities alone could be as high as $8 billion. A third study,[2] conducted by the Association of Physical Plant Administrators of Universities and Colleges (APPA), estimated the cost to colleges and universities to be in the realm of $750 million.

[1]O'Neill, David M. 1977. "Discrimination Against Handicapped Persons: The Costs, Benefits and Economic Impact of Implementing Section 504 of the Rehabilitation Act of 1973 Covering Recipients of HEW Financial Assistance," U.S. Office for Civil Rights, Washington, D.C.

[2]Association of Physical Plant Administrators of Universities and Colleges. 1978. "A Study to Evaluate Selected Transition Plans Developed by Colleges and Universities to Comply with Section 504 of the Rehabilitation Act of 1973," Washington, D.C.

Meanwhile, interest in the cost implications—particularly for colleges and universities—heightened when Congress rejected an Administration request for $50 million for colleges and universities to use in renovating their physical plants. In rejecting the request, the House Labor-HEW Appropriations Subcommittee cited the lack of reliable cost data. The economic impact statement prepared for OCR, which estimated a cost of between $117 and $261 million for higher education, was based on only four institutions. The APPA study was based on a larger sample of 91 institutions, but the sample was by design non-representative and the study repeatedly cautioned against using the results for developing national cost estimates.

In response, NCES added cost data to its questionnaire and, in September 1978, conducted a national survey of 700 college and university physical facilities for OCR. The study had two primary goals. One was to develop a reliable estimate of the cost to American colleges and universities of complying with the program accessibility provisions of Section 504 as they relate to the mobility impaired. The other was to examine the relationship between physical plant accessibility and program accessibility.

Limits of the NCES Study

Anne Arundel Community College, Arnold, Maryland

It is essential for anyone using the results of this study to realize that NCES has limited the scope of its survey in four important areas. In all four cases, some part of Section 504 coverage has been limited, with the result that the cost figures presented here do not contain all costs needed to meet the requirements of the law.

The first limitation was to restrict the categories of handicapped individuals covered by the study. It was essential for NCES to provide a uniform evaluation mechanism and develop a methodology for examining facilities on college and university campuses. This was best done by limiting this study to an examination of facilities and of program accessibility for mobility impaired persons only. (See appendix A for the definition of "mobility impaired" used in the NCES survey and study.)

The second limitation was to exclude costs for auxiliary aids and services required by Section 504 (e.g., readers for the blind). These services represent recurring costs to the institutions. This investigation was intended to estimate only the one-time cost for modifying a physical facility.

The third limitation of the study was to restrict the definition of the facilities examined for program accessibility. The Section 504 regulations define "facility" as "all or any portion of buildings, structures, equipment, roads, walks, parking lots, or other real or personal property or interest in such property." The NCES study is limited to building accessibility, which includes the walkway, stairs and entrances to the building. Again, NCES limited the facilities considered in order to provide a more uniform evaluation mechanism.

Finally, all costs incurred by institutions before September 15, 1978, were excluded from the study. Although it was known that many institutions, often publicly controlled, have expended significant amounts, this study did not attempt to measure such costs.

The effect of these limitations is that the cost figures presented in this report represent underestimates of the *total* cost of implementing Section 504. Furthermore, the reader should keep in mind that this study examines only those costs required for compliance with Section 504 of the Rehabilitation Act of 1973. Some States have passed laws requiring institutions to develop "barrier free" environments over and above program accessibility. These additional costs incurred by institutions in complying with non-Federal laws have been excluded from this study.

While the limitations described above cause the cost figures presented in this study to be low, the major one-time cost factors have been retained. Furthermore, these design limitations permitted NCES to develop a methodology which would maximize the uniformity of cost reporting.

Accessibility—Its Cost and Character

Southern Illinois University at Edwardsville

The NCES study indicates that the Nation's colleges and universities must spend approximately $561 million to make their facilities program accessible to the mobility impaired. This figure breaks down to over $316 million for the 1,463 public institutions and almost $245 million for the 1,620 private institutions (see table 1).

On the average, then, a public institution would spend $216,200, a private institution $151,100. However, the average public institution has twice the assignable space[1] of its private counterpart. This means that the cost per assignable square foot (ASF) is actually higher for the private sector ($0.47) than for the public sector ($0.34).

In terms of cost per full-time equivalent (FTE) enrollment, the differing impact is even more pronounced. The cost to public institutions translates to $50.99/FTE, while private institutions face an average cost of $109.86/FTE (table 2).

Using cost per assignable square foot as the measure of impact, the data indicate that private other 4-year and private 2-year institutions[2] are the most severely affected by Section 504. While private universities and all types of public institutions will incur average costs of less than $0.38/ASF, the average cost for private 4-year institutions is $0.55/ASF and for private 2-year institutions is $0.69/ASF.

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[1] Assignable space is defined as the sum of all areas on all floors of a building assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant (except custodial, circulation, mechanical, and structural areas). On the average, two-thirds of an institution's gross area is assignable space.

[2] Institutions of higher education (or the individual branches of multicampus institutions) included in this report are classified as either universities, other 4-year or 2-year institutions. Universities and other 4-year institutions offer programs extending at least 4 years beyond high school. Universities, while granting bachelor's degrees, also place considerable emphasis on graduate instruction and have at least two professional schools that are not exclusively technological. Other 4-year institutions grant bachelor's degrees or some recognition equivalent to such degrees (e.g., ecclesiastical recognition in theological institutions) but do not emphasize graduate or professional education. Two-year institutions offer organized programs of up to 2 years that result in an associate degree or some other recognition of completion such as a certificate or diploma.

This conclusion is supported using cost per FTE as a measure of impact as well. The costs to private other 4-year and private 2-year institutions are estimated to be $145.26/FTE and $112.65/FTE, respectively, compared to costs under $66.00/FTE for all other types of institutions

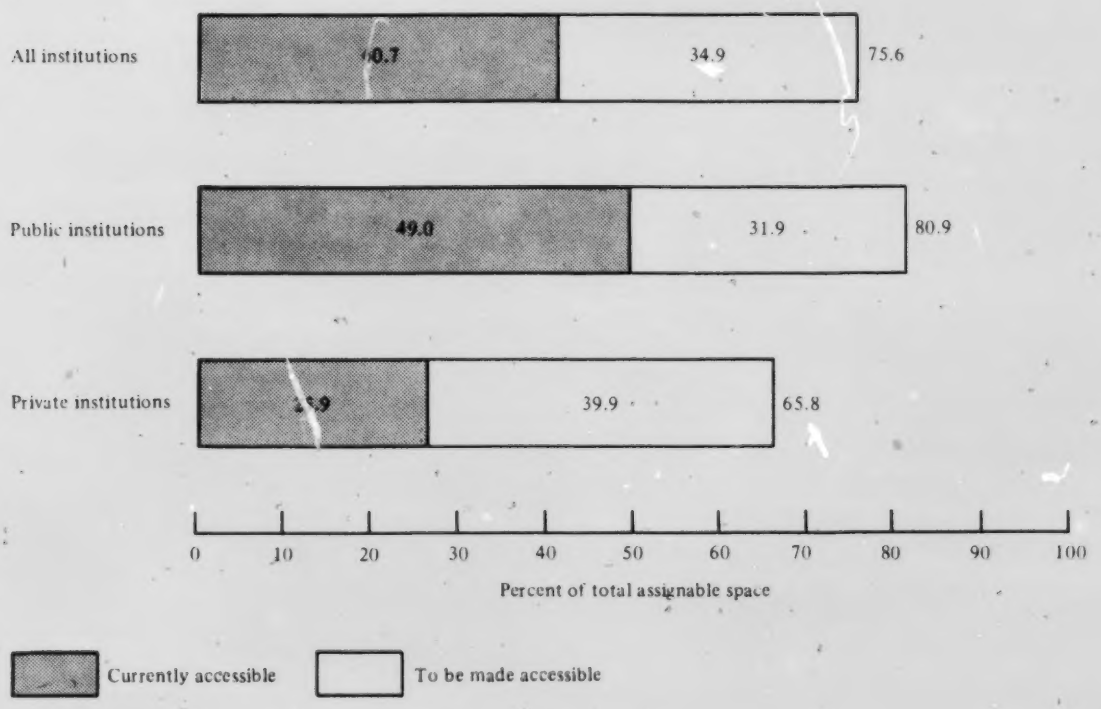
The range of costs found in the NCES study varied from a high of over $7.50/ASF for one institution down to no cost for another. Ten percent of the institutions will incur costs of over $1.32/ASF and 20 percent will incur costs of over $0.88/ASF. On the other hand, 20 percent of the institutions will have to spend less than $0.18/ASF and 10 percent will incur costs of under $0.11/ASF (table 3). The disproportionate impact on the private sector is again highlighted by the fact that 28.4 percent of the private four-year institutions and 38.5 percent of the private two-year institutions are among the 20 percent of all institutions with the highest cost per assignable square foot.

The challenge facing the nation's colleges and universities is considerable. Just over 40 percent of the total assignable space is currently accessible to the mobility impaired. As chart 1 shows, an average of over 75 percent of an institution's assignable space will have to be accessible to the handicapped before program accessibility is achieved. Thus, our institutions of higher education are barely halfway toward meeting this goal which, in the case of architectural modifications, must be achieved by June, 1980. Almost half of the assignable space in public institutions is currently accessible, compared to just over one-fourth of the space in private institutions. However, the average public institution will require 80.9 percent physical accessibility in order to achieve program accessibility, compared to only 65.8 percent in the average private institution. (Of course, the amount of accessibility required depends on the unique characteristics of each institution.) The result is that both sectors still must make over 30 percent of their total assignable space physically accessible in order to meet the requirements of Section 504.

The cost of modifying a facility increases with the age of the structure. For buildings constructed before 1900, the NCES study found that $2.51 is required for each assignable square foot of space which is to be made accessible through physical plant modification. (Note that this measure is different from cost per *total* ASF.) In contrast, the corresponding figure for buildings constructed since 1975 is $0.34 per square foot. The overall average is $1.11 per square foot. (Detailed cost factors are shown in table 4.)

For private institutions, the age factor is more significant than for other institutions. While only 10 percent

Chart 1.—Physical accessibility of American colleges and universities, by control of institution



of the space in public institutions is in facilities built before 1931, almost one-fourth (22.5 percent) of the space in private institutions was in facilities constructed before that year. On the other hand, 26.5 percent of the space in public institutions was in buildings constructed after 1970, compared to only 15.4 percent for private institutions. The cost per assignable square foot is therefore much higher for private institutions.

For space to be made accessible, the cost per assignable square foot is comparable across public and private institutions. The only exception is for newer facilities, where the cost is considerably less in the private sector than in the public sector. For buildings constructed since 1971, the cost to private institutions averages $0.30 per square foot, while the corresponding cost to the public sector is $0.58 per square foot. The data indicate that, in facilities built since 1971, the public sector will have to make accessible 78 percent of the space which is currently inaccessible. This amount compares with only 58 percent for private institutions. The difference suggests that more special purpose facilities (e.g., astronomy laboratories, advanced scientific and technical laboratories) may be involved in the public modifications. Modifications to such facilities would generally be associated with higher costs.

Because renovating older facilities is more costly, institutions are choosing to modify newer facilities when they can. In doing this, large institutions have considerably more alternatives available to them than do small institutions. In a large institution, one finds that a greater proportion of the total space was constructed after World War II than one would find in a small institution. In addition, the larger amount of space devoted to each program will frequently permit the large institution to select rescheduling as an alternative to structural modification. This option is often not available to the small institution. The result is that the cost per total assignable space increases as the size of the institution decreases (table A).

Table A.—Cost per assignable square foot (ASF) of space, by size of institution

Size (total ASF)	Average cost	Cost per ASF
Over 5,000,000	$2,046,700	$0.30
1,000,001 - 5,000,000	697,500	0.34
500,001 - 1,000,000	286,900	0.41
100,001 - 500,000	135,600	0.55
0 - 100,000	41,500	0.83

Note. Data in this and succeeding tables are from the September 1978 survey unless otherwise noted.

On the whole, accessibility of programs located in older buildings is being achieved in large part by relocating those activities into newer facilities. Colleges and universities are planning to make accessible only 40 percent of the inaccessible space in structures built before 1900 (table 4). About 70 percent of the corresponding space in facilities constructed since 1971 will be made accessible. This strategy minimizes the total cost involved and has the additional benefit that the remaining life of the newer buildings should be greater than that of the older facilities.

To limit the evaluation of the impact of Section 504 to a comparison of the public and private sectors would be misleading, since the relative mix of types of institutions within each sector differs considerably. Over 62 percent of the public institutions are 2-year institutions, while 81.5 percent of the private schools are other 4-year institutions (chart 2). As shown in table 1, the average cost per assignable square foot varies considerably among the different types of institutions. Therefore, to fully understand how Section 504 affects our institutions of higher education, one must examine its impact on each type of institution. This is done in the next three sections of this report.

Universities

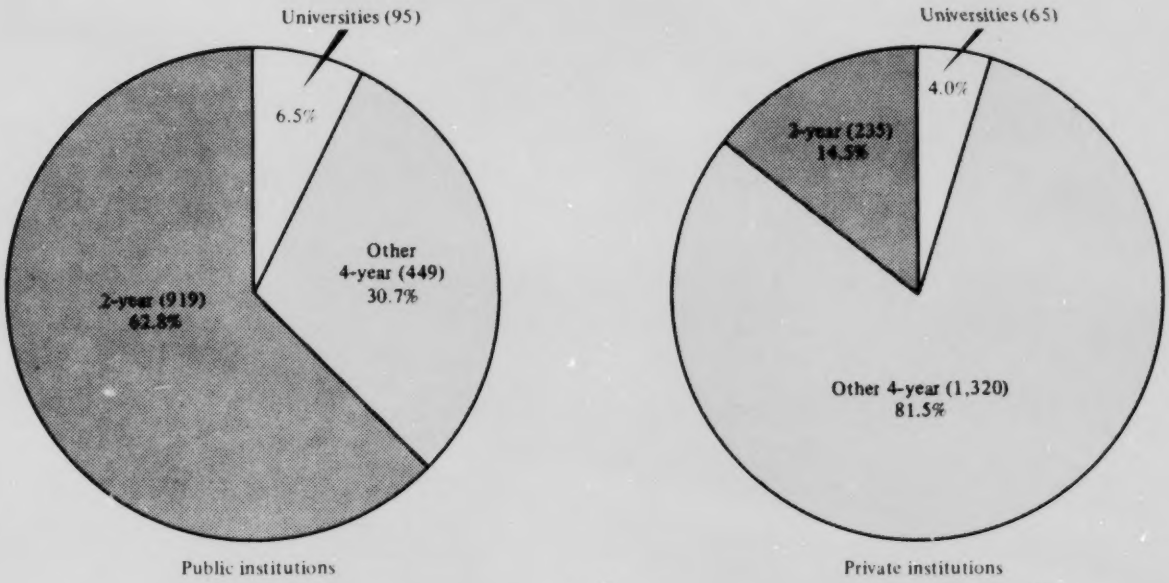
It will cost $150 million to make American universities accessible to mobility impaired students, according to the NCES study. Over $113 million will be needed by the 95 public universities, and achieving program accessibility will cost the 65 private universities almost $37 million. The average cost to a public university will be $1,191,200, over twice the average cost to a private university.

When size is taken into account, one notes that the impact on the two sectors is similar: $0.29 per assignable square foot for public universities, compared to $0.25 for private universities. These costs are well below the average cost of $0.38 for all institutions. In fact, no public or private university was found among the top 10 percent of all institutions with the highest cost per assignable square foot.

Measuring the impact of Section 504 in terms of cost per FTE student, one again finds little difference between the two sectors. The cost to public universities is $65.25/FTE, compared to $63.17/FTE for private universities. One interesting peculiarity is the fact that, while universities had the lowest cost per assignable square foot among public institutions, their cost per full-time equivalent enrollment is the highest of the three types of public institutions. This situation is at least partially attributable to the large amount of dormitory space and special programs in public universities not found in public other 4-year and 2-year institutions.

Both public and private universities must make significantly more space accessible in order to comply with

Chart 2.–Percent distribution of public and private institutions, by type of institution



Section 504. In the case of public universities, 48.5 percent of the assignable space is currently accessible, but 74.0 percent will need to be accessible for program accessibility. Forty percent of the assignable space in private universities is currently accessible, compared to a figure of 68.0 percent needed by June 2, 1980.

The cost impact of Section 504 on American universities is surprisingly uniform throughout the country.[1] With the exception of the Southeast region, the average cost per assignable square foot is between $0.25/ASF and $0.29/ASF for both public and private institutions in each of the regions (chart 3). An interesting contrast is reflected in the Southeast region. The cost to public universities is $0.36/ASF, well above the average of $0.29/ASF for all public universities. On the other hand, the cost to private universities in the Southeast is only $0.17/ASF, compared to a national average of $0.25/ASF.

In the case of public universities, the reason for the higher cost in the Southeast region is fairly evident. As depicted in chart 3, Southeastern universities have significantly less space currently accessible than do universities in other regions. What's more, the Southeastern institutions must make an additional 36.4 percent of their total space accessible, compared with 21.1 to 25.9 percent in the other regions.

The reasons for the lower cost to private universities in the Southeast are more complex. As with public Southeastern universities, the private institutions have the smallest proportion of space currently accessible and the largest proportion of space which must be made accessible of the four regions. However, much less of the space which has to be modified is found in older buildings which are more expensive to modify. In private Southeastern universities, only 3.6 percent of the total assignable space represents space constructed prior to 1931 which must be made accessible, compared to 6.1 percent for private universities nationally (table 6). In public Southeastern universities, on the other hand, 6.4 percent of the total assignable space both was constructed prior to 1931 and must be made accessible, compared to 4.7 percent for public universities nationwide.

Public and private universities are quite similar with respect to the proportion of each type of space which must be made accessible. With the exceptions of processing rooms, demonstration and assembly space, lounge and recreation areas, and public waiting space–where public universities must make considerably larger proportions of the space accessible–there are only small differences between the profiles of the two sectors (chart 4).

Other 4-Year Institutions

The results of the NCES study indicate that over $330 million will be required by other 4-year institutions to meet the physical aspects of program accessibility. The

[1] This finding is affected by the use of a single cost norm for each type of needed renovation and therefore excludes local and regional differences due to building codes, labor costs or other factors.

Chart 3.–Physical accessibility of universities, by control and region

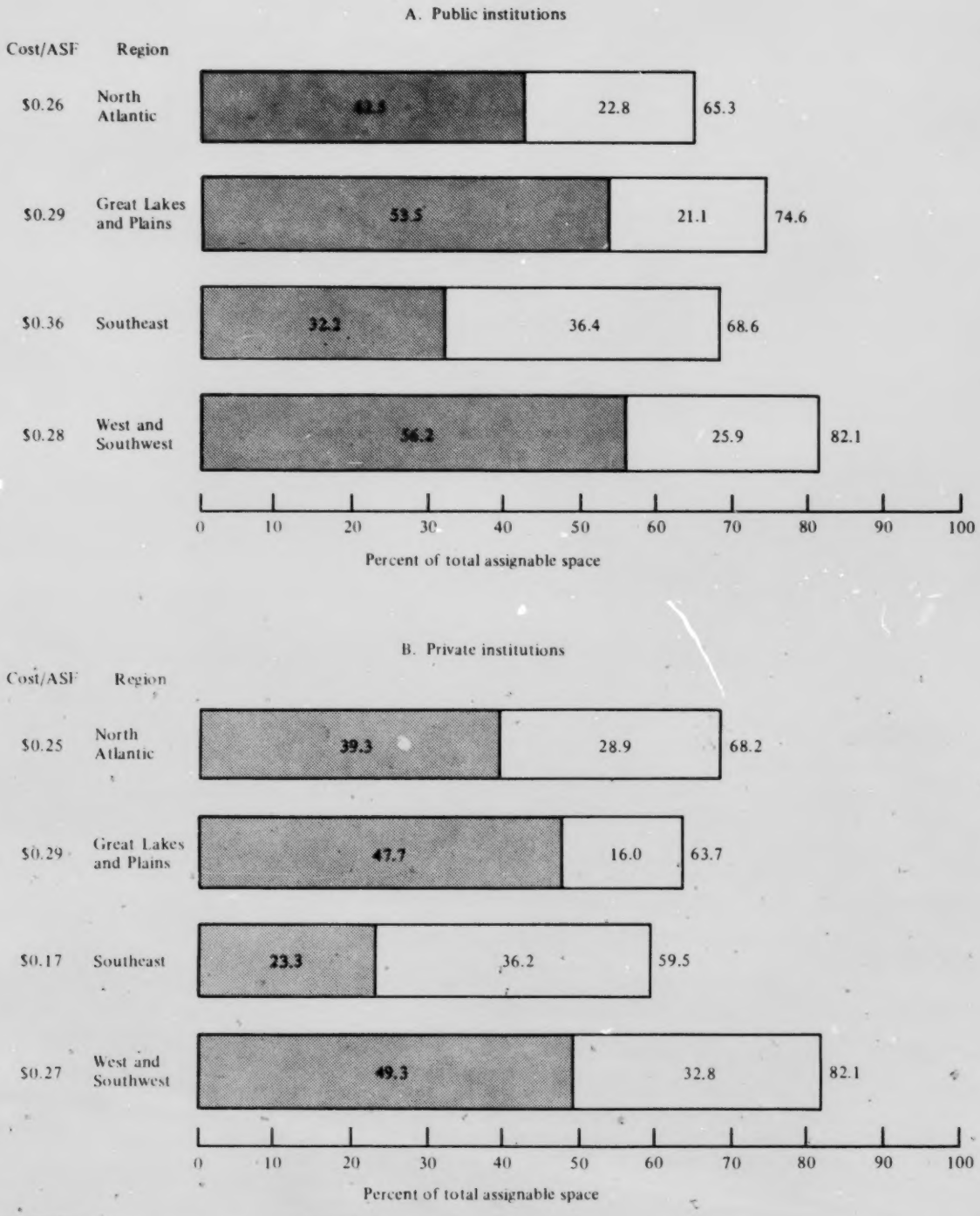
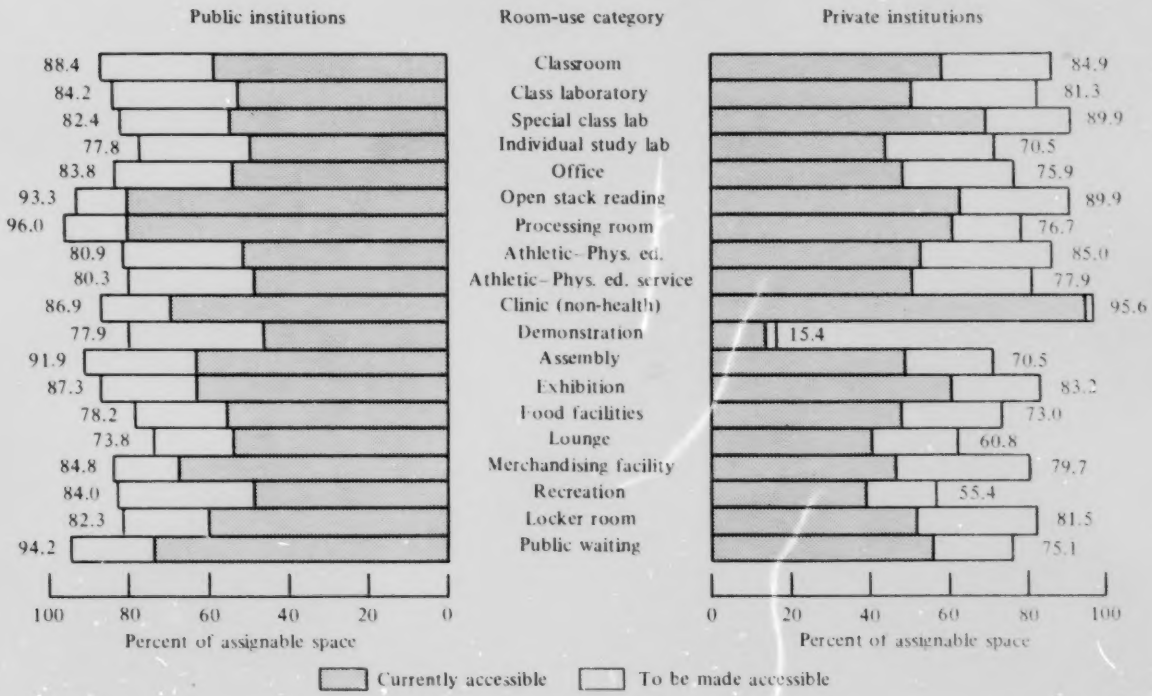


Chart 4.–Accessibility profile of universities, by room-use category



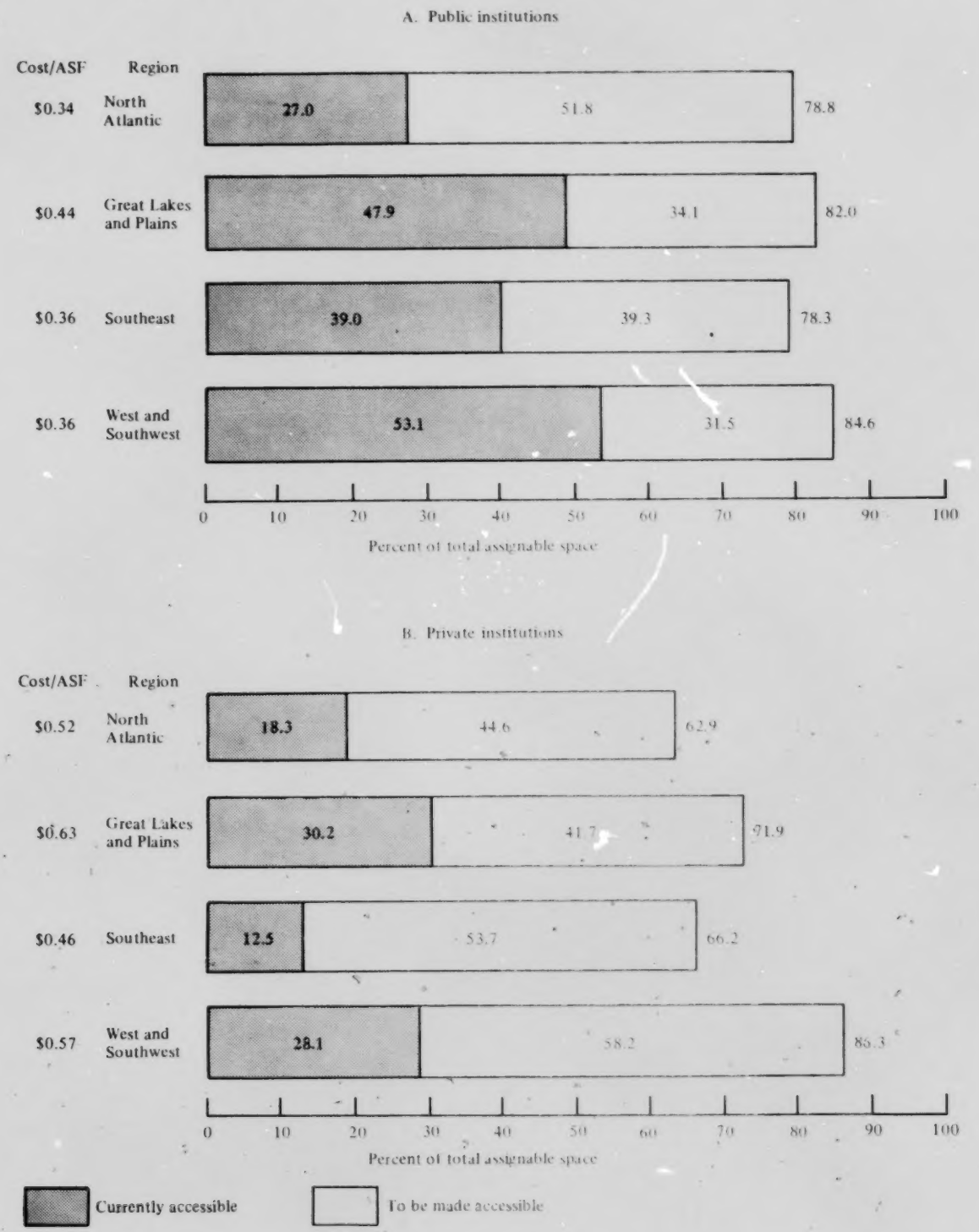
449 public other 4-year institutions will need $308,600 per institution, over twice the $145,600 required by their 1,320 private counterparts. However, the average public other 4-year institution has over three times the space and almost five times the FTE enrollment of the average private other 4-year institution. Thus, the impact of Section 504 would appear to be worse on private other 4-year institutions ($0.55/ASF and $145.26/FTE) than on public institutions of the same type ($0.37/ASF and $63.56/FTE).

Public other 4-year institutions are currently just over halfway toward meeting the physical requirements of program accessibility. As of September 15, 1978, 42.1 percent of the total assignable space was found to be accessible to the mobility impaired, compared to an estimated 80.9 percent required for program accessibility. The situation in the private sector is much worse. There only 20.5 percent of the assignable space is currently accessible, compared to the 65.2 percent required by June 2, 1980. The larger number of specialized programs offered in public institutions is probably a major factor why they must have a larger proportion of their space accessible in order to achieve program accessibility.

As with universities, the cost impact of Section 504 on other 4-year institutions is reasonably uniform across the country. Among public institutions, only the Great Lakes and Plains region has a cost outside a range of $0.34/ASF to $0.36/ASF. In that region, the higher cost of $0.44/ASF is attributable to the amount of older space which must be made accessible. Almost 5 percent of the space in the Great Lakes and Plains region is space constructed before 1931 that must be made accessible. This compares to a figure of 3.3 percent for all public other 4-year institutions.

In the private sector, the costs range from $0.46/ASF in the Southeast region to $0.63/ASF in the Great Lakes and Plains region. Costs in the North Atlantic and Southeast regions are lower, partially because institutions there have less need to convert physical space to achieve program accessibility (chart 5). In addition, the other 4-year institutions in these two regions are larger than schools in the other regions. These two factors suggest that North Atlantic and Southeastern institutions have more flexibility in the ways they can respond to Section 504 than do their Western counterparts. On the other hand, the North Atlantic and Southeastern institutions have the smallest proportions of space currently accessible and have the largest proportions of older space which must be made accessible. So the complete reason for the cost variations is not clear.

Chart 5.–Physical accessibility of other 4-year institutions, by control and region



The physical accessibility requirements by room-use category[1] are amazingly consistent for public and private other 4-year institutions. The patterns for the two sectors are virtually identical except that, for each category, public institutions must make somewhat more space accessible than private other 4-year institutions (chart 6).

2-Year Institutions

The Nation's 2-year institutions will need $80 million to make their buildings accessible to the mobility impaired. The average cost per institution is about the same in the public and private sectors, with the 919 public 2-year institutions incurring costs of $70,200 per institution, compared to $67,200 per private institution.

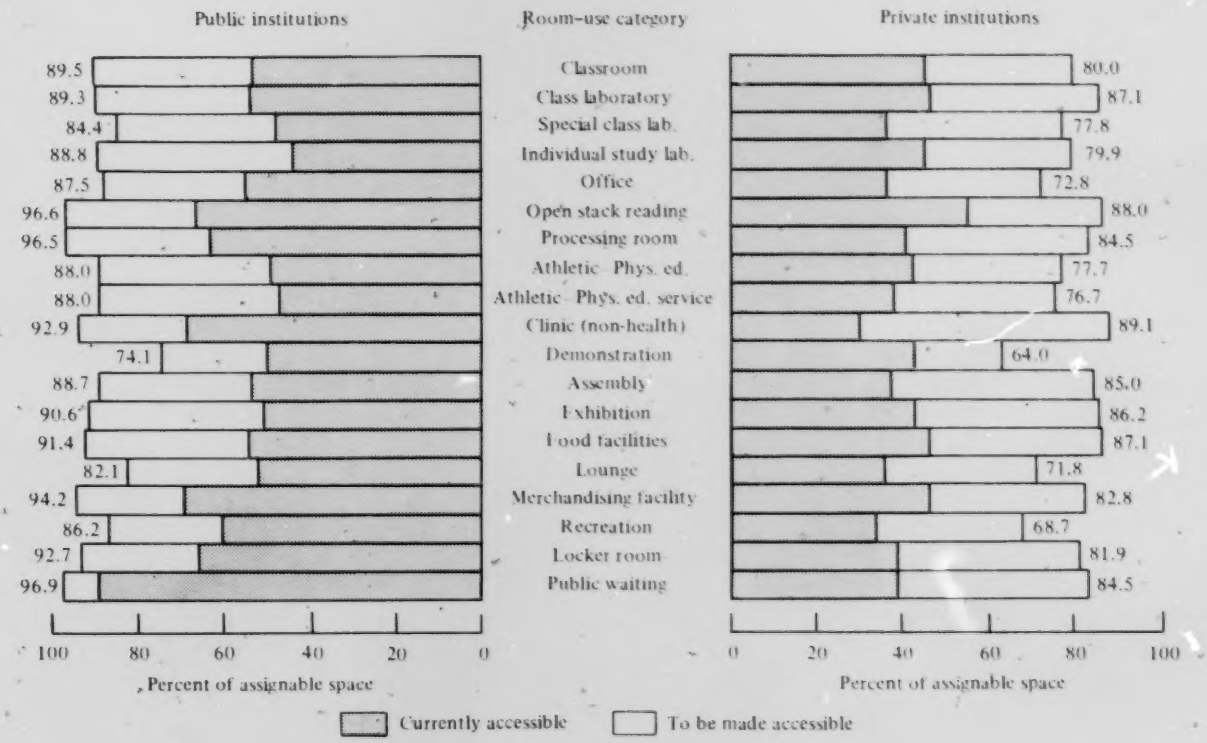
Substantial differences are detected when size is taken into account, however. In terms of cost per assignable square foot, the impact on the private sector ($0.69/ASF) is twice that on public institutions ($0.35/ASF). The difference is even more marked using cost-per-student as a measure of impact. The cost to private 2-year institutions ($112.65/FTE) is four times the cost ($28.20/FTE) facing public 2-year institutions.

According to the NCES study, nearly two-thirds of the total assignable space in public 2-year institutions is currently accessible. However, the study also indicated that these same institutions will have to become almost "barrier free," with an estimated 95.5 percent of the space needed to be physically accessible in order to achieve program accessibility. This large percentage is due, in part, to the general absence of dormitories, combined with the wide variety of programs offered at public 2-year institutions.

While private 2-year institutions will be required to have substantially less space accessible to the mobility impaired than will their public counterparts (60.0 percent versus 95.5 percent), the private schools had less

[1] Room use, as employed in this report, is a term referring to a specialized classification that describes the types or uses of any assignable space at an institution of higher education. The classification appears in *Facilities Inventory and Classification Manual, 1973,* (OE 74-11424). Less than twenty categories of use were requested in the survey instrument. These items represented the most common types of space or were specialized areas which might have been overlooked by many institutions when reviewing their needs for program accessibility.

Chart 6.—Accessibility profile of other 4-year institutions, by room-use category



than one-fifth of their space accessible on September 15, 1978. This situation accounts for the severe impact of Section 504 on these schools, despite the lower proportion of their space which must ultimately be accessible.

Unlike the situation with universities and other 4-year institutions, the impact on 2-year institutions varies widely by region. Among public institutions, the costs vary from $0.22/ASF in the Great Lakes and Plains region to $0.55/ASF in the North Atlantic region. The low cost in the Great Lakes and Plains region is largely explained by the fact that 81.5 percent of the assignable space in the 2-year institutions in that region is currently accessible. As a result, these institutions must make only an additional 15.1 percent of their total assignable space accessible—less than half the percentage required by any other region (chart 7). At the same time, at least three factors underlie the unusually high cost to public 2-year institutions in the North Atlantic region. They have the smallest percentage of space currently accessible, and they must make the largest additional space available by June 2, 1980. Compounding the situation, 4.9 percent of the total space in these institutions was constructed before 1931 and must be made accessible. This is over four times the corresponding figure in any other region (table 6).

The regional cost variations are equally great among private 2-year institutions. The cost of $1.00/ASF in the North Atlantic region is over twice the average cost of $0.41/ASF observed in the West and Southwest region. As chart 7 shows, the cost is directly related to the accessibility profiles of the various regions. The region with the highest cost per assignable square foot has the smallest percentage of space currently accessible, the largest percentage of space to be made accessible, and the largest total percentage of space which must be accessible on June 2, 1980. On the other hand, the profile of the region with the lowest cost is the reverse of that with the highest.

A profile of accessibility by room-use category (chart 8) indicates that public 2-year institutions must make every category of room use over 90 percent accessible except non-health clinic space. The proportion of space currently accessible is also quite uniform across categories for the public institutions. Private 2-year institutions, on the other hand, show wide variation in the space currently accessible, as well as the proportion of each category of space which must be accessible in 1980.

Chart 7. - Physical accessibility of 2-year institutions, by control and region

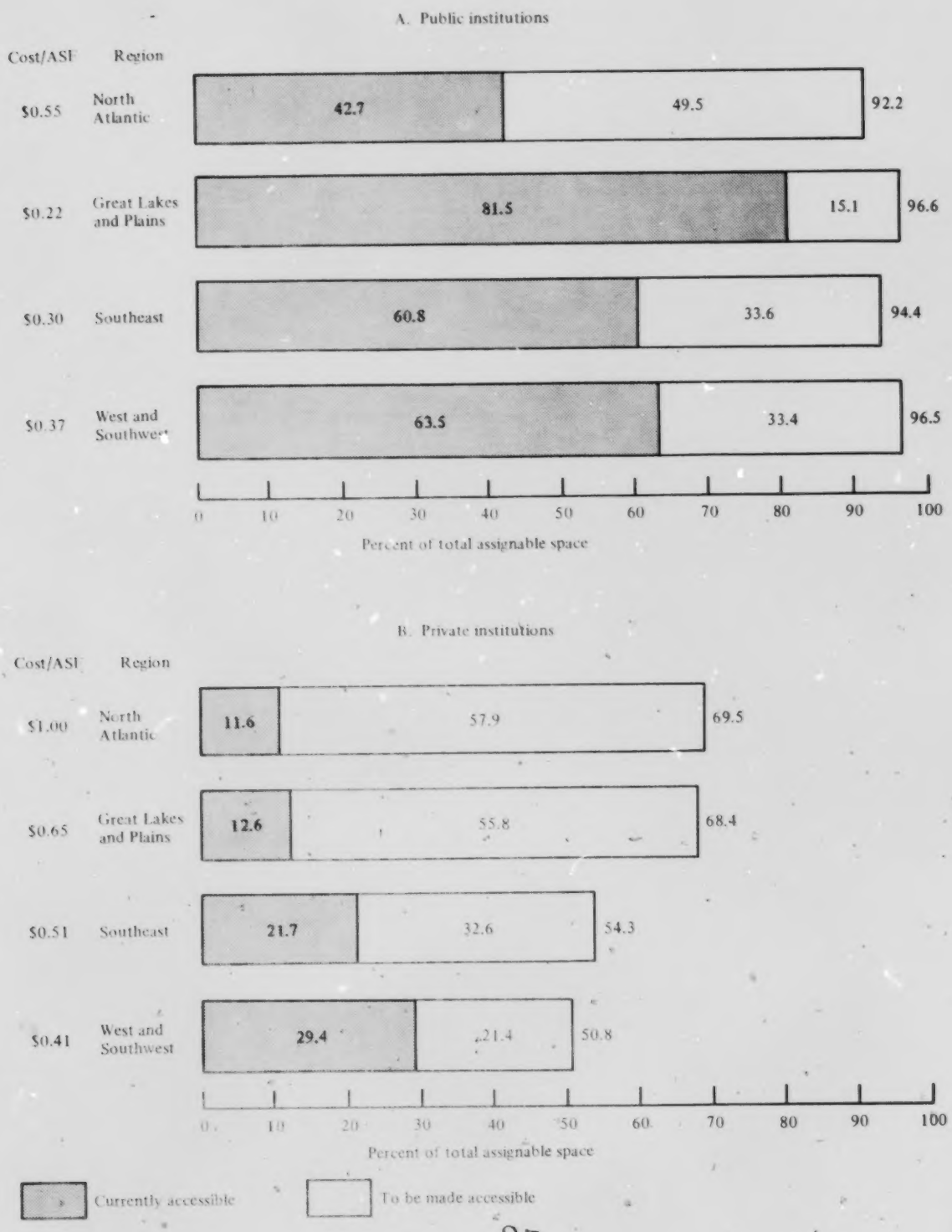


Chart 8.–Accessibility profile of 2-year institutions, by room-use category

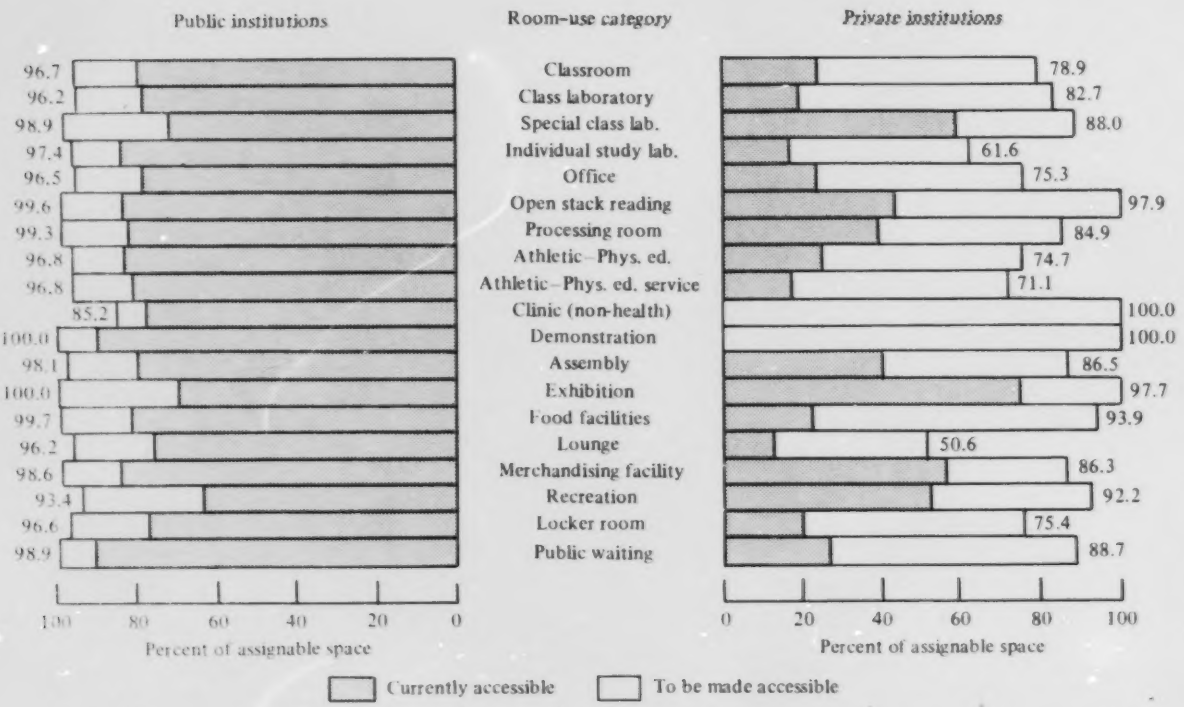


Table 1.–Cost per assignable square foot (ASF) of space and average size, by control, type and region of institution

A. Total United States

Control and type	Number	Average size[1]	Total cost	Cost/institution	Cost/ASF
All institutions					
Total	3,083	473,100	$561,008,400	$182,000	$0.38
Universities	160	3,318,600	150,001,700	937,500	0.28
Other 4-year	1,769	407,700	330,703,500	186,900	0.46
2-year	1,154	178,800	80,303,200	69,600	0.39
Public institutions					
Total	1,463	642,000	$316,238,400	$ 216,200	$0.34
Universities	95	4,048,800	113,168,400	1,191,200	0.29
Other 4-year	449	826,800	138,550,200	308,600	0.37
2-year	919	199,500	64,519,800	70,200	0.35
Private institutions					
Total	1,620	320,500	$244,770,000	$151,100	$0.47
Universities	65	2,251,500	36,833,300	566,700	0.25
Other 4-year	1,320	265,100	192,153,300	145,600	0.55
2-year	235	97,800	15,783,400	67,200	0.69

[1]Measured in assignable square feet (ASF)

B. North Atlantic Region[1]

Control and type	Number	Average size[2]	Total cost	Cost/institution	Cost/ASF
All institutions					
Total	868	431,100	$151,389,300	$174,400	$0.40
Universities	46	2,811,700	33,229,600	722,400	0.26
Other 4-year	563	362,500	92,075,700	163,500	0.45
2-year	259	157,400	26,084,000	100,710	0.64
Public institutions					
Total	301	560,000	$60,419,400	$ 200,700	$0.36
Universities	14	3,835,000	14,140,800	1,010,100	0.26
Other 4-year	119	688,200	27,986,100	235,200	0.34
2-year	168	196,400	18,292,500	108,900	0.55
Private institutions					
Total	567	362,700	$90,969,900	$160,400	$0.44
Universities	32	2,364,000	19,088,800	596,500	0.25
Other 4-year	444	275,200	64,089,600	144,300	0.52
2-year	91	85,500	7,791,500	85,600	1.00

[1]Includes: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont
[2]Measured in assignable square feet (ASF)

Table 1.–Cost per assignable square foot (ASF) of space and average size, by control, type and region of institution

C. Great Lakes and Plains Region[1]

Control and type	Number	Average size[2]	Total cost	Cost/institution	Cost/ASF
All institutions					
Total	826	507,500	$167,081,100	$ 202,300	$0.40
Universities	45	3,964,400	51,362,000	1,141,400	0.29
Other 4-year	487	390,700	103,018,600	211,500	0.54
2-year	294	171,700	12,700,500	43,200	0.25
Public institutions					
Total	366	769,700	$90,475,800	$ 247,200	$0.32
Universities	31	4,846,400	43,313,200	1,397,200	0.29
Other 4-year	91	935,500	37,128,800	408,000	0.44
2-year	244	189,900	10,033,800	41,100	0.22
Private institutions					
Total	460	298,800	$76,605,300	$166,500	$0.56
Universities	14	2,011,300	8,048,800	574,900	0.29
Other 4-year	396	265,600	65,889,800	166,400	0.63
2-year	50	82,600	2,666,700	53,300	0.65

[1]Includes: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
[2]Measured in assignable square feet (ASF)

D. Southeast Region[1]

Control and type	Number	Average size[2]	Total cost	Cost/institution	Cost/ASF
All institutions					
Total	690	459,200	$116,169,500	$ 168,400	$0.37
Universities	28	3,260,800	29,127,000	1,040,200	0.32
Other 4-year	376	477,900	71,502,300	190,200	0.40
2-year	286	160,300	15,540,200	54,300	0.34
Public institutions					
Total	366	598,100	$76,006,800	$ 207,700	$0.35
Universities	21	3,433,700	25,828,700	1,229,900	0.36
Other 4-year	128	850,900	38,703,300	302,400	0.36
2-year	217	174,600	11,474,800	52,900	0.30
Private institutions					
Total	324	302,300	$40,162,700	$124,000	$0.41
Universities	7	2,742,100	3,298,300	471,200	0.17
Other 4-year	248	285,400	32,799,000	132,300	0.46
2-year	69	115,600	4,065,400	58,900	0.51

[1]Includes: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia
[2]Measured in assignable square feet (ASF)

Table 1.–Cost per assignable square foot (ASF) of space and average size, by control, type and region of institution

E. West and Southwest Region[1]

Control and type	Number	Average size[2]	Total cost	Cost/institution	Cost/ASF
All institutions					
Total	699	498,300	$126,368,500	$180,800	$0.36
Universities	41	3,218,200	36,283,100	885,000	0.27
Other 4-year	343	428,800	64,106,900	186,900	0.44
2-year	315	219,900	25,978,500	82,471	0.38
Public institutions					
Total	430	628,000	$89,336,400	$ 207,800	$0.33
Universities	29	3,744,900	29,885,700	1,030,500	0.28
Other 4-year	111	858,300	34,732,000	312,900	0.36
2-year	290	228,200	24,718,700	85,200	0.37
Private institutions					
Total	269	290,900	$37,032,100	$137,700	$0.47
Universities	12	1,945,400	6,397,400	533,100	0.27
Other 4-year	232	223,300	29,374,900	126,600	0.57
2-year	25	124,300	1,259,800	50,400	0.41

[1]Includes: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, Wyoming

[2]Measured in assignable square feet (ASF)

Table 2.–Cost per full-time equivalent (FTE) enrollment, by control and type of institution

Control and type	Number	FTE enrollment[1]	Total cost	Cost/FTE
All institutions				
Total	3,083	8,248,055	$561,008,400	[illegible]
Universities	160	2,317,429	150,001,700	[illegible]
Other 4-year	1,769	3,502,709	330,703,500	[illegible]
2-year	1,154	2,427,917	80,303,200	[illegible]
Public institutions				
Total	1,463	6,202,043	$316,238,400	[illegible]
Universities	95	1,734,387	113,168,400	[illegible]
Other 4-year	449	2,179,849	138,550,200	[illegible]
2-year	919	2,287,807	64,519,800	[illegible]
Private institutions				
Total	1,620	2,046,012	$244,770,000	[illegible]
Universities	65	583,042	36,833,300	[illegible]
Other 4-year	1,320	1,322,860	192,153,300	[illegible]
2-year	235	140,110	15,783,400	[illegible]

[1]Source: National Center for Education Statistics, *Fall Enrollment in Colleges and Universities, 1978 (Preliminary Estimates)*

Table 3.–Percent of institutions in selected cost brackets, by control and type

Cost bracket	Cost range[1]	Public institutions			Private institutions		
		Universities	Other 4-year	2-year	Universities	Other 4-year	2-year
Highest							
5%	Over $2.23	0.0	0.0	1.2	0.0	10.8	0.0
10%	Over $1.32	0.0	0.8	2.9	0.0	18.3	15.5
20%	Over $0.88	5.3	6.0	12.2	11.5	[illegible]	[illegible]
Lowest							
5%	Under $0.07	8.9	2.3	9.0	5.4	2.5	6.6
10%	Under $0.11	13.2	14.5	9.8	16.2	7.0	16.2
20%	Under $0.18	23.2	30.2	23.3	41.5	[illegible]	[illegible]

[1]Cost is in terms of dollars per assignable square foot (ASF) of space

Table 4.—Total inaccessible space, percent to be modified, and cost per square foot, by year of construction of facility and control of institution

Year of construction	Inaccessible space[1]	Percent of inaccessible space to be modified	Cost per square foot[2]
All institutions			
Total	864,216,600	58.7	$1.11
Pre -1900	32,443,100	40.0	2.51
1900-1930	125,383,600	48.5	2.06
1931-1950	101,441,100	54.1	1.51
1951-1960	147,699,700	58.0	1.22
1961-1970	331,808,300	61.8	0.84
1971-1974	85,124,100	70.7	0.56
1975-present	40,316,700	69.2	0.34
Public institutions			
Total	479,330,600	62.7	$1.05
Pre -1900	7,524,400	36.0	2.78
1900-1930	54,688,200	56.0	1.93
1931-1950	60,797,100	52.7	1.46
1951-1960	82,484,900	59.0	1.17
1961-1970	196,098,300	64.1	0.88
1971-1974	55,358,400	76.5	0.64
1975-present	22,379,300	81.0	0.43
Private institutions			
Total	384,886,000	53.9	$1.18
Pre -1900	24,918,700	41.2	2.44
1900-1930	70,695,400	42.6	2.19
1931-1950	40,644,000	56.2	1.58
1951-1960	65,214,800	56.7	1.30
1961-1970	135,710,000	58.5	0.77
1971-1974	29,765,700	60.1	0.37
1975-present	17,937,400	54.5	0.16

[1]Measured in assignable square feet (ASF)
[2]Cost per square foot of space to be made accessible

Table 5.–Space inventory of college and university physical facilities and associated costs for achieving program accessibility for the mobility impaired, by control and type of institution

A. All institutions

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	2,178,806,200	1,458,499,100	594,282,500	864,216,600	507,622,100	$561,008,400
Pre -1900	59,552,300	38,871,700	6,428,600	32,443,100	12,968,600	32,547,600
1900-1930	254,162,600	167,444,200	42,060,600	125,383,600	60,777,500	125,148,800
1931-1950	209,754,000	143,174,400	41,733,300	101,441,100	54,907,700	82,739,400
1951-1960	324,950,600	220,489,100	72,789,400	147,699,700	85,694,100	104,801,100
1961-1970	838,301,000	559,596,700	227,788,400	331,808,300	205,159,800	172,537,000
1971-1974	314,168,400	206,730,100	121,606,000	85,124,100	60,218,500	33,785,800
1975-present	177,917,300	122,192,900	81,876,200	40,316,700	27,895,900	9,448,700

B. All public institutions

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	1,410,735,500	939,222,100	459,891,500	479,330,600	300,350,300	$316,238,400
Pre -1900	15,314,500	9,796,900	2,272,500	7,524,900	2,708,900	7,527,800
1900-1930	125,658,500	82,143,000	27,454,800	54,688,200	30,648,500	59,291,600
1931-1950	137,196,000	93,573,900	32,776,800	60,797,100	32,051,700	46,645,300
1951-1960	201,618,800	136,764,900	54,280,000	82,484,900	48,692,600	56,729,500
1961-1970	556,891,100	370,153,000	174,054,700	196,098,300	125,794,900	111,101,300
1971-1974	238,724,600	155,177,200	99,818,800	55,358,400	42,328,000	27,103,100
1975-present	135,332,000	91,613,200	69,233,900	22,379,300	18,125,700	7,839,800

Table 5.–Space inventory of college and university physical facilities and associated costs for achieving program accesibility for the mobility impaired, by control and type of institution

C. All private institutions

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	768,070,700	519,227,000	134,391,000	384,886,000	207,271,800	$244,770,000
Pre -1900	44,237,800	29,074,800	4,156,100	24,918,700	10,259,700	25,019,800
1900-1930	128,504,100	85,301,200	14,605,800	70,695,400	30,129,000	65,857,200
1931-1950	72,558,000	49,600,500	8,956,500	40,644,000	22,856,000	36,094,100
1951-1960	123,331,800	83,724,200	18,509,400	65,214,800	37,001,500	48,071,600
1961-1970	281,409,900	189,443,700	53,733,700	135,710,000	79,364,900	61,435,700
1971-1974	75,443,800	51,552,900	21,787,200	29,765,700	17,890,500	6,682,700
1975-present	42,585,300	30,579,700	12,642,300	17,937,400	9,770,200	1,608,900

D. Public universities

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	589,613,100	384,636,700	186,559,800	198,076,900	98,155,100	$113,168,400
Pre -1900	8,350,100	5,260,100	1,112,700	4,147,400	1,637,600	5,083,900
1900-1930	76,458,900	50,055,600	18,686,100	31,369,500	16,267,900	29,993,100
1931-1950	75,259,900	51,721,000	17,786,100	33,934,900	14,874,800	19,291,100
1951-1960	98,465,300	65,686,500	27,336,600	38,349,900	19,440,700	20,543,200
1961-1970	212,110,000	135,942,600	67,912,000	68,030,600	34,276,600	27,997,300
1971-1974	81,125,800	51,091,800	33,961,900	17,129,900	8,586,900	7,344,900
1975-present	37,843,100	24,879,100	19,764,400	5,114,700	3,070,600	2,915,000

Table 5.–Space inventory of college and university physical facilities and associated costs for achieving program accessibility for the mobility impaired, by control and type of institution

E. Public other four-year institutions

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	563,423,000	371,211,800	156,459,200	214,752,600	144,022,300	$138,550,200
Pre -1900	5,062,800	3,151,600	760,700	2,390,900	665,900	1,354,200
1900-1930	40,615,100	25,975,500	6,404,400	19,571,100	11,451,400	19,660,100
1931-1950	50,595,200	33,591,500	10,875,800	22,715,700	13,949,700	21,451,200
1951-1960	85,633,200	57,876,800	21,387,000	36,489,800	23,106,600	27,989,800
1961-1970	241,029,200	160,178,200	61,174,700	99,003,500	65,993,100	55,316,100
1971-1974	89,809,000	56,728,400	32,633,400	24,095,000	20,234,100	10,260,200
1975-present	50,678,500	33,709,800	23,223,200	10,486,600	8,621,500	2,518,600

F. Public two-year institutions

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	257,699,400	183,373,600	116,872,500	66,501,100	58,172,900	$64,519,800
Pre -1900	1,901,600	1,385,200	399,100	986,100	405,400	1,089,700
1900-1930	8,584,500	6,111,900	2,364,300	3,747,600	2,929,200	9,638,400
1931-1950	11,340,900	8,261,400	4,114,900	4,146,500	3,227,200	5,903,100
1951-1960	17,520,300	13,201,600	5,556,400	7,645,200	6,145,300	8,196,500
1961-1970	103,751,900	74,032,200	44,968,000	29,064,200	25,525,200	27,787,900
1971-1974	67,789,800	47,357,000	33,223,500	14,133,500	13,507,000	9,498,000
1975-present	46,810,400	33,024,300	26,246,300	6,778,000	6,433,600	2,406,200

Table 5.–Space inventory of college and university physical facilities and associated costs for achieving program accessibility for the mobility impaired, by control and type of institution

G. Private universities

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	227,863,200	146,347,000	58,484,900	87,862,100	41,056,500	$36,833,300
Pre -1900	10,822,500	7,066,200	2,241,500	4,824,700	2,200,400	2,739,200
1900-1930	46,903,100	29,145,100	7,348,300	21,796,800	6,694,200	11,536,200
1931-1950	22,774,500	14,797,700	4,793,600	10,004,100	5,139,700	7,037,300
1951-1960	34,769,400	22,342,000	6,964,000	15,378,000	7,013,700	5,566,900
1961-1970	75,246,200	48,640,500	21,981,300	26,659,200	13,887,600	8,512,400
1971-1974	25,480,100	16,462,700	10,783,100	5,679,600	3,206,500	965,200
1975-present	11,867,400	7,892,800	4,373,100	3,519,700	2,914,400	476,100

H. Private other four-year institutions

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	508,628,300	349,940,200	71,702,400	278,237,800	156,620,000	$192,153,300
Pre -1900	32,065,800	21,090,800	1,832,900	19,257,900	7,631,800	20,463,100
1900-1930	76,646,100	52,520,000	7,205,000	45,315,000	21,701,300	51,159,900
1931-1950	46,553,700	32,545,800	4,031,900	28,513,900	16,663,000	26,065,500
1951-1960	84,017,000	57,952,200	10,357,200	47,595,000	28,630,200	40,342,700
1961-1970	191,480,500	130,228,400	30,336,000	99,892,400	61,097,900	47,853,100
1971-1974	48,414,000	33,933,700	10,439,700	23,494,000	14,245,100	5,167,900
1975-present	29,451,200	21,669,300	7,499,700	14,169,600	6,650,700	1,101,100

Table 5.–Space inventory of college and university physical facilities and associated costs for achieving program accessibility for the mobility impaired, by control and type of institution

I. Private two-year institutions

Year of construction	Gross square feet	Assignable square feet			Inaccessible space to be made accessible for Section 504 compliance	
		Total	Accessible	Inaccessible	Total assignable square feet	Estimated cost of modifications
Total	31,579,200	22,989,800	4,203,700	18,786,100	9,595,900	$15,783,400
Pre -1900	1,349,500	917,800	81,700	836,100	427,500	1,817,500
1900-1930	4,954,900	3,636,100	52,500	3,583,600	1,733,500	3,161,100
1931-1950	3,229,800	2,257,000	131,000	2,126,000	1,083,300	2,991,300
1951-1960	4,545,400	3,430,000	1,188,200	2,241,800	1,357,600	2,162,000
1961-1970	14,683,200	10,574,800	1,416,400	9,158,400	4,379,400	5,070,200
1971-1974	1,549,700	1,156,500	564,400	592,100	438,900	549,600
1975-present	1,266,700	1,017,600	769,500	248,100	205,100	31,700

Table 6.–Assignable space constructed before 1931 which must be made accessible as a percent of total assignable space, by control, type, and region of institution

Control and type	Total United States	North Atlantic	Great Lakes and Plains	Southeast	West and Southwest
Public					
University	4.7	2.7	4.4	6.4	4.8
Other 4-year	3.3	4.2	4.7	3.0	1.8
2-year	1.8	4.9	0.8	1.1	1.2
Private					
University	6.1	7.5	5.0	3.6	4.8
Other 4-year	8.4	9.7	7.0	8.9	6.9
2-year	9.4	13.7	18.7	7.1	0.0

Table 7.--Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control and type of institution

Room-use category	Public institutions						Private institutions					
	University		Other 4-year		2-year		University		Other 4-year		2-year	
	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980
Classroom	58.0	88.4	52.6	89.5	79.9	96.7	57.9	84.9	46.6	80.0	24.0	78.9
Class laboratory	52.9	84.2	53.6	89.3	78.6	96.2	50.2	81.3	47.4	87.1	19.5	82.7
Special class lab.	55.6	82.4	47.4	84.4	72.5	98.9	68.1	89.9	37.2	77.8	58.3	88.0
Individual study lab.	51.1	77.8	43.3	88.8	84.7	97.4	43.3	70.5	45.7	79.9	16.1	61.6
Office	54.1	83.8	54.2	87.5	78.9	96.5	47.6	75.9	37.1	72.8	24.1	75.3
Open stack reading	81.1	93.3	66.4	96.6	84.0	99.6	62.4	89.9	56.0	88.0	42.3	97.9
Processing room	81.3	96.0	62.7	96.5	82.1	99.3	60.3	76.7	41.8	84.5	38.8	84.9
Athletic - phys. ed.	51.9	80.9	48.5	88.0	82.7	96.8	52.3	85.0	42.8	77.7	25.4	74.7
- phys. ed. service	49.5	80.3	47.8	88.0	80.6	96.8	50.7	77.9	39.2	76.7	17.0	71.1
Clinic (non-health)	69.2	86.9	67.9	92.9	77.6	85.2	94.7	95.6	30.4	89.1	0.0	100.0
Demonstration	39.9	77.9	49.2	74.1	89.7	100.0	13.4	15.4	43.0	64.0	0.0	100.0
Assembly	63.6	91.9	52.7	88.7	79.1	98.1	48.3	70.5	38.4	85.0	39.7	86.5
Exhibition	63.2	87.3	50.2	90.6	69.4	100.0	60.3	83.2	43.5	86.2	74.4	97.7
Food facilities	55.7	78.2	53.9	91.4	81.3	99.7	47.5	73.0	47.2	87.1	22.7	93.9
Lounge	54.1	73.8	51.1	82.1	76.2	96.2	40.0	60.8	36.4	71.8	13.7	50.6
Merchandising facility	68.0	84.8	68.7	94.2	83.8	98.6	46.0	79.7	47.2	82.8	56.4	86.3
Recreation	49.1	84.0	60.2	86.2	63.6	93.4	38.5	55.4	34.4	68.7	52.2	92.2
Locker room	59.6	82.3	65.8	92.7	76.7	96.6	51.5	81.5	39.2	81.9	20.2	75.4
Public waiting	73.7	94.2	89.3	96.9	89.8	98.9	54.9	75.1	39.3	84.5	27.5	88.7

Table 8.–Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control, type and region of institution

A. Public universities

Room-use category	Total United States		North Atlantic		Great Lakes and Plains		Southeast		West and Southwest	
	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980
Classroom	58.0	88.4	58.1	76.8	60.3	91.0	44.1	87.1	60.6	90.2
Class laboratory	52.9	84.2	46.2	77.4	57.5	84.5	37.4	89.9	58.2	81.9
Special class lab.	55.6	82.4	50.1	79.0	59.8	82.0	42.2	80.2	63.6	86.9
Individual study lab.	51.1	77.8	70.0	89.4	50.7	77.0	26.4	72.4	60.8	79.5
Office	54.1	83.8	56.6	72.1	58.9	86.5	39.5	82.9	58.3	85.2
Open stack reading	81.1	93.3	95.9	99.4	81.9	91.6	63.4	96.6	83.2	91.5
Processing room	81.3	96.0	97.9	98.5	83.8	95.6	57.7	96.6	85.5	95.3
Athletic - phys. ed.	51.9	80.9	36.1	83.9	56.9	86.8	42.4	70.0	55.6	78.9
- phys. ed. service	49.5	80.3	23.4	72.9	51.4	82.2	34.9	73.9	69.7	85.9
Clinic (non-health)	69.2	86.9	91.0	92.6	71.1	91.8	49.6	82.3	54.6	76.3
Demonstration	39.9	77.9	45.6	56.5	32.8	78.6	51.6	77.0	52.2	79.6
Assembly	63.6	91.9	71.4	87.9	80.2	94.9	28.7	84.2	66.1	91.5
Exhibition	63.2	87.3	63.6	85.6	60.7	83.5	45.6	82.2	73.5	93.5
Food facilities	55.7	78.2	67.2	72.8	47.8	76.3	35.4	68.8	86.7	92.5
Lounge	54.1	73.8	57.4	65.7	53.7	74.5	38.9	65.6	65.3	82.0
Merchandising facility	68.0	84.8	82.6	88.2	70.3	84.5	42.1	73.4	93.0	98.4
Recreation	49.1	84.0	59.4	81.8	41.6	84.4	30.6	74.3	76.7	91.8
Locker room	59.6	82.3	29.9	50.2	61.9	73.2	65.6	95.9	56.0	91.5
Public waiting	73.7	94.2	72.1	83.3	85.0	90.0	45.8	94.1	87.8	92.3

Table 8.–Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control, type and region of institution

B. Public other 4-year institutions

Room-use category	Total United States		North Atlantic		Great Lakes and Plains		Southeast		West and Southwest	
	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980
Classroom	52.6	89.5	37.1	81.3	57.1	96.2	48.3	86.5	68.4	94.6
Class laboratory	53.6	89.3	35.9	82.0	63.3	90.9	50.4	87.1	62.9	95.0
Special class lab.	47.4	84.4	32.1	65.8	49.3	90.3	43.0	87.7	67.4	93.3
Individual study lab.	43.3	88.8	18.2	88.6	63.8	91.6	41.3	88.4	58.9	87.2
Office	54.2	87.5	38.9	82.1	63.2	93.7	45.7	83.2	68.5	92.5
Open stack reading	66.4	96.6	41.5	92.9	76.8	97.3	69.4	97.8	78.2	98.2
Processing room	62.7	96.5	33.5	91.4	75.4	99.7	69.2	96.0	70.9	99.0
Athletic - phys. ed.	48.5	88.0	24.8	87.1	55.9	84.5	60.8	89.7	51.2	90.5
- phys. ed. service	47.8	88.0	31.6	94.0	49.4	83.5	54.2	82.5	57.1	97.0
Clinic (non-health)	67.9	92.9	47.0	81.4	75.3	97.2	43.7	93.5	90.5	97.1
Demonstration	49.2	74.1	45.9	88.9	46.7	68.1	51.6	63.6	62.4	96.7
Assembly	52.7	88.7	40.8	81.8	61.0	94.9	55.3	88.2	55.8	92.0
Exhibition	50.2	90.6	19.9	91.3	54.5	89.8	62.8	87.7	52.3	93.0
Food facilities	53.9	91.4	37.6	90.3	50.7	86.1	62.5	94.9	69.9	96.1
Lounge	51.2	82.1	43.4	78.4	50.5	78.0	51.8	86.2	59.8	86.5
Merchandising facility	68.7	94.2	60.4	88.5	75.1	97.4	70.4	94.2	66.9	96.0
Recreation	60.2	86.2	51.3	80.2	63.5	86.5	59.4	87.5	65.0	90.1
Locker room	65.8	92.7	48.0	88.4	53.2	95.8	54.0	72.3	89.7	98.9
Public waiting	89.3	96.9	66.1	99.4	82.8	95.7	57.0	77.5	95.8	98.8

Table 8.–Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control, type and region of institution

C. Public 2-year institutions

Room-use category	Total United States		North Atlantic		Great Lakes and Plains		Southeast		West and Southwest	
	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980
Classroom	79.9	96.7	68.1	98.5	90.4	96.5	75.5	96.5	78.5	96.1
Class laboratory	78.6	96.2	64.8	99.3	88.5	96.4	72.4	92.9	80.4	96.7
Special class lab.	72.5	98.9	60.5	99.2	71.6	99.5	69.6	96.4	78.2	99.7
Individual study lab.	84.5	97.4	70.2	100.0	92.8	99.4	75.1	90.8	88.9	99.7
Office	78.9	96.5	56.5	96.3	92.0	97.5	76.9	95.4	81.3	96.4
Open stack reading	84.0	99.6	75.0	100.0	89.3	99.5	84.5	99.3	85.6	99.5
Processing room	82.1	99.3	61.8	99.8	90.2	95.9	80.3	99.9	92.4	99.6
Athletic - phys. ed.	82.7	96.8	78.3	98.5	86.5	98.6	81.9	94.8	82.5	95.1
- phys. ed. service	80.6	96.8	73.6	99.9	78.1	87.9	88.5	97.0	82.0	98.9
Clinic (non-health)	77.6	85.2	88.7	100.0	62.3	74.6	100.0	100.0	97.3	97.3
Demonstration	89.7	100.0	100.0	100.0	63.0	100.0	95.0	100.0	100.0	100.0
Assembly	79.1	98.1	65.7	99.5	87.4	96.9	66.0	91.8	82.9	100.0
Exhibition	69.4	100.0	43.2	100.0	57.7	100.0	81.8	100.0	88.2	100.0
Food facilities	81.3	99.7	59.8	99.8	98.8	99.7	79.0	99.1	80.2	100.0
Lounge	76.2	96.2	57.1	100.0	80.1	95.8	81.7	94.5	85.2	94.4
Merchandising facility	83.8	98.6	59.9	100.0	96.4	97.9	85.2	98.1	83.9	98.8
Recreation	63.6	93.4	38.8	98.1	91.2	93.4	72.9	97.1	45.4	85.0
Locker room	76.7	96.6	59.1	95.0	80.1	97.5	91.9	96.5	90.0	97.7
Public waiting	89.8	98.9	85.3	100.0	86.8	100.0	88.9	100.0	96.2	96.2

Table 8.–Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control, type and region of institution

D. Private universities

Room-use category	Total United States		North Atlantic		Great Lakes and Plains		Southeast		West and Southwest	
	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980
Classroom	57.9	84.9	57.5	83.8	69.7	78.6	35.5	85.1	80.1	92.7
Class laboratory	50.2	81.3	49.9	78.0	87.7	96.0	31.8	88.0	66.8	88.4
Special class lab.	68.1	89.9	76.2	89.6	90.9	92.6	50.7	83.6	51.9	99.1
Individual study lab.	43.3	70.5	42.4	61.6	100.0	100.0	27.6	87.7	100.0	100.0
Office	47.6	75.9	56.0	78.7	50.4	69.6	18.9	75.6	37.1	64.6
Open stack reading	62.4	89.9	58.7	86.7	99.1	99.2	44.4	94.5	99.5	99.5
Processing room	60.3	76.7	61.6	80.2	74.3	74.3	46.0	78.8	66.5	66.5
Athletic - phys. ed.	52.3	85.0	55.4	87.2	64.9	94.3	16.0	57.4	62.9	94.0
- phys. ed. service	50.7	77.9	47.8	79.4	100.0	100.0	14.8	48.9	100.0	100.0
Clinic (non-health)	94.7	95.6	94.3	94.9	0.0	0.0	97.4	100.0	0.0	0.0
Demonstration	13.4	15.4	77.0	77.9	0.2	2.4	100.0	100.0	0.2	2.4
Assembly	48.3	70.5	40.8	72.0	49.4	56.5	67.7	92.7	49.1	55.8
Exhibition	60.3	83.2	61.1	72.3	73.9	95.8	54.5	73.6	50.7	96.6
Food facilities	47.5	73.0	42.4	72.8	52.1	73.8	56.7	81.4	51.8	55.3
Lounge	40.0	60.8	40.4	62.9	55.4	68.4	26.2	49.9	63.6	68.1
Merchandising facility	46.0	79.7	37.8	84.6	57.7	72.0	47.5	82.2	56.0	69.3
Recreation	38.5	55.4	46.5	81.5	30.7	36.6	30.2	42.7	45.6	46.7
Locker room	51.5	81.5	56.0	86.7	46.2	77.7	27.3	79.9	62.2	70.0
Public waiting	54.9	75.1	44.7	65.0	95.3	95.3	75.1	98.7	95.3	95.3

Table 8.–Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control, type and region of institution

E. Private other 4-year institutions

Room-use category	Total United States		North Atlantic		Great Lakes and Plains		Southeast		West and Southwest	
	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980
Classroom	46.6	80.0	46.3	77.9	55.3	87.2	32.2	72.3	54.9	83.9
Class laboratory	47.4	87.1	36.3	80.5	59.1	91.9	43.6	87.7	54.0	91.1
Special class lab.	37.2	77.8	26.3	82.8	47.5	73.5	37.3	73.5	44.0	79.6
Individual study lab.	45.7	79.7	31.7	77.5	68.0	87.6	29.7	70.5	46.3	80.0
Office	37.1	72.8	31.2	67.3	47.6	78.9	24.6	69.6	45.6	77.4
Open stack reading	56.0	88.0	58.6	86.2	59.0	89.8	44.4	83.1	58.9	93.6
Processing room	41.8	84.5	50.4	80.0	41.6	81.7	26.4	89.0	38.2	95.9
Athletic - phys. ed.	42.8	77.7	36.5	76.6	40.8	72.0	42.3	85.5	60.5	81.1
- phys. ed. service	39.2	76.7	29.9	70.4	42.7	85.4	37.6	76.3	54.6	75.2
Clinic (non-health)	30.4	89.1	16.1	91.3	100.0	100.0	26.0	88.5	57.3	83.2
Demonstration	43.0	64.0	26.3	77.8	51.3	70.1	8.7	17.9	87.5	88.8
Assembly	38.4	85.0	29.4	85.1	57.9	87.6	28.2	86.1	32.6	80.1
Exhibition	43.5	86.2	36.0	87.6	49.5	93.5	38.4	70.0	69.0	87.6
Food facilities	47.2	87.1	39.8	84.3	63.7	92.8	24.7	83.8	57.1	86.2
Lounge	36.4	71.8	26.6	63.3	54.5	79.6	28.2	67.7	38.1	82.3
Merchandising facility	47.2	82.8	37.8	86.9	50.8	86.1	41.6	75.5	64.7	80.0
Recreation	34.4	68.7	24.1	62.2	29.2	63.0	35.3	66.5	58.2	90.5
Locker room	39.2	81.9	25.8	59.9	23.0	93.8	43.5	77.6	85.8	91.5
Public waiting	39.3	84.5	39.6	70.9	50.5	99.4	20.5	81.1	49.4	95.3

Table 8.–Percent of assignable space accessible on September 15, 1978, and to be accessible by June 2, 1980, by room-use category and control, type and region of institution

F. Private 2-year institutions

Room-use category	Total United States		North Atlantic		Great Lakes and Plains		Southeast		West and Southwest	
	1978	1980	1978	1980	1978	1980	1978	1980	1978	1980
Classroom	24.0	78.9	19.6	92.7	0.3	82.4	29.6	72.0	41.3	58.7
Class laboratory	19.5	82.7	15.6	95.2	1.4	94.6	32.4	68.1	25.2	59.4
Special class lab.	58.3	88.0	88.5	95.3	0.0	78.1	0.0	86.2	84.4	86.4
Individual study lab.	16.1	61.6	35.7	83.0	0.0	52.4	9.4	49.4	34.3	74.6
Office	24.1	75.3	26.2	97.7	0.9	66.4	23.7	62.7	34.7	67.8
Open stack reading	42.3	97.9	45.8	98.2	51.9	100.0	50.6	100.0	9.1	90.9
Processing room	38.8	84.9	39.7	63.4	0.0	100.0	60.1	100.0	5.7	100.0
Athletic - phys. ed.	25.4	74.7	16.7	77.0	0.0	92.8	37.4	81.7	19.8	53.0
- phys. ed. service	17.0	71.1	8.8	77.1	0.0	78.2	33.0	82.7	1.2	45.3
Clinic (non-health)	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Demonstration	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
Assembly	39.7	86.5	22.2	100.0	1.4	94.6	45.7	80.3	52.2	84.2
Exhibition	74.4	97.7	42.2	100.0	99.2	99.8	0.0	78.0	0.0	100.0
Food facilities	22.7	93.9	9.8	100.0	17.1	100.0	40.6	92.5	16.6	74.6
Lounge	13.7	50.6	11.2	100.0	22.0	75.0	16.3	32.8	11.1	16.4
Merchandising facility	56.4	86.3	20.0	86.9	13.5	92.0	73.2	86.8	83.8	100.0
Recreation	52.2	92.2	0.0	100.0	34.7	85.8	40.3	88.8	95.1	95.1
Locker room	20.2	75.4	0.0	84.9	0.0	100.0	16.5	100.0	53.3	53.3
Public waiting	27.5	88.7	16.2	82.1	3.5	100.0	13.0	100.0	100.0	100.0

Higher Education and the Handicapped Today

Colorado State University, Fort Collins

The reasoning behind the passage of Section 504 is amply illustrated in the enrollment patterns of handicapped students. The patterns clearly suggest that these students avoid institutions where program accessibility is limited. Inaccessibility may even force them to avoid college altogether.

This conclusion is borne out by a 1976 NCES survey[1] which indicated that, while handicapped children under the age of 14 are more likely to enroll in school than are nonhandicapped children, the opposite is true for individuals 14 years of age and older. Among the college-aged population (18 to 25 years of age), the 1976 study found that only 29.0 percent of the handicapped persons were enrolled compared to 36.3 percent for the college-aged population as a whole.

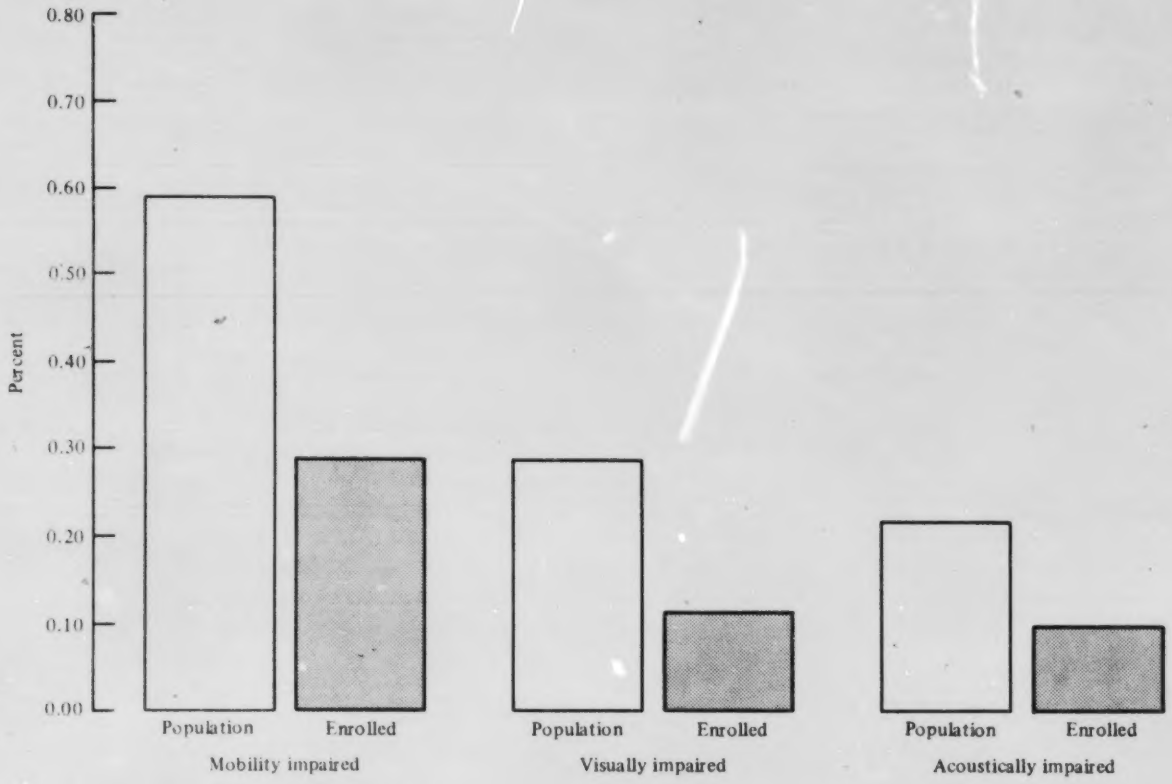
That the handicapped are underrepresented in college is further supported by the findings of the 1978 NCES Facilities Inventory. This study estimates that 32,721 mobility impaired, 13,745 visually impaired and 11,256 acoustically impaired individuals enrolled in American colleges and universities in fall 1978. These figures represent 0.29 percent, 0.12 percent and 0.10 percent of the total fall 1978 enrollment in higher education, respectively (table 9). Yet the 1976 NCES Survey of Income and Education shows that these three groups comprise, respectively, 0.59 percent, 0.29 percent and 0.22 percent of the college-aged population (chart 9). In each case, those handicapped enrolled in higher education represent less than half their proportion in the college-aged population.

The pattern of institutions selected by handicapped persons differs from that of the college and university population as a whole. The NCES study shows that over 91 percent of the mobility impaired students enrolled in public institutions, compared to 78 percent of all students. The percentages of visually impaired students (83.7 percent) and acoustically impaired students (87.1 percent) in public institutions also exceeded the percentage for all students, though to a lesser degree.

Even more noteworthy are the differences in the types of institutions selected. While 36 percent of all students enrolled in colleges and universities attended 2-year institutions, half of the mobility impaired and almost 57

[1] National Center for Education Statistics, Survey of Income and Education, Spring 1976.

Chart 9.—Representation of handicapped individuals in the population and in higher education



Note: Population figures are for individuals 18-25 years old.

Sources: National Center for Education Statistics: *Survey of Income and Education, Spring 1976,* preliminary estimates; *Survey of Opening Fall Enrollment, Fall 1978;* preliminary estimates; and *Inventory of College and University Physical Facilities, Fall 1978.*

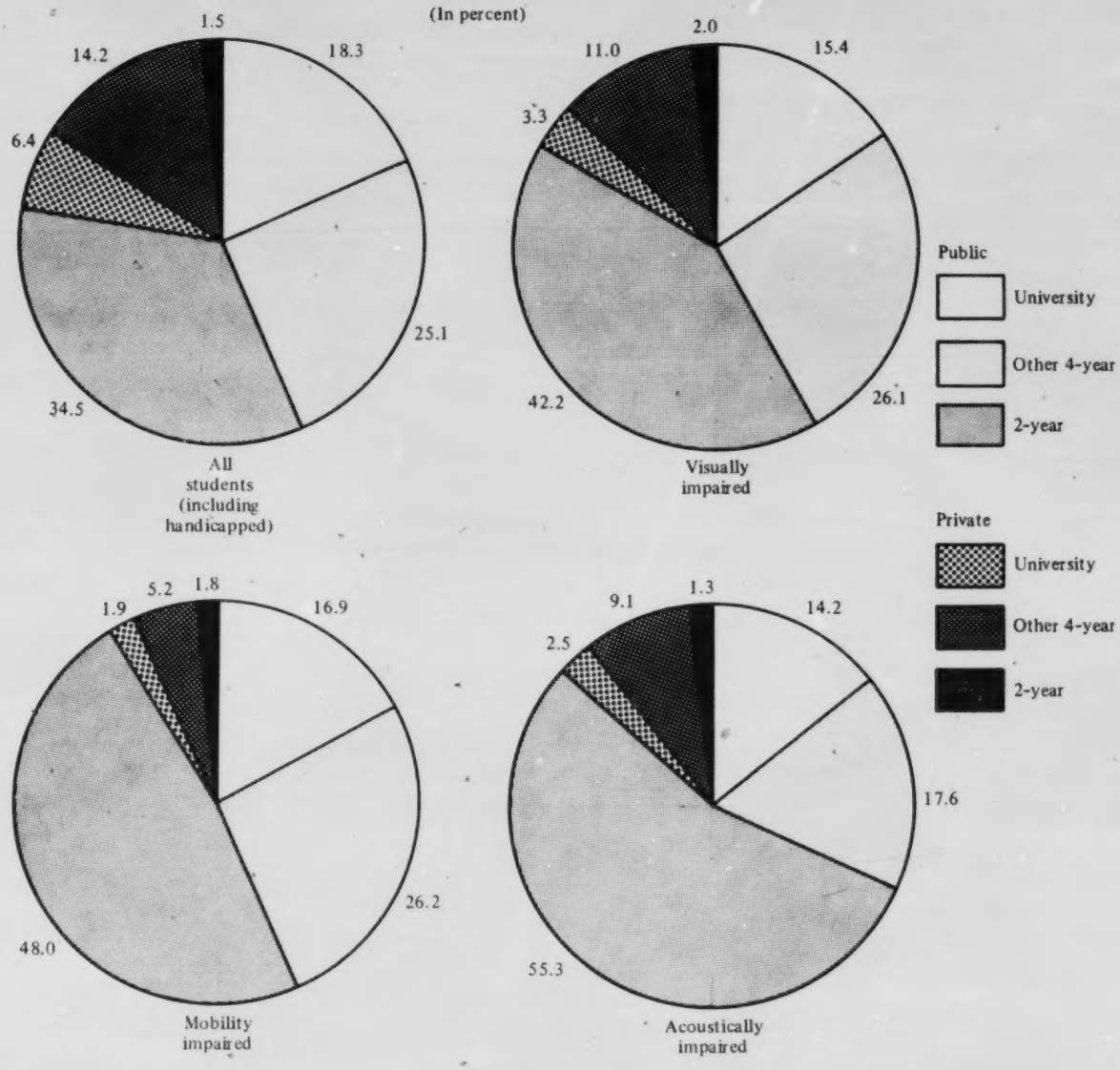
percent of the acoustically impaired students attended 2-year institutions. Public 2-year institutions, then, are the predominant choice of handicapped students today (chart 10). On the other hand, handicapped persons are least represented on the campuses of private universities and private other 4-year institutions.

Mobility impaired students also exhibit different regional enrollment patterns from the college population in general. Almost half of those enrolled attended institutions in the West and Southwest regions (chart 11). This compares to less than one third of all students. The regional patterns for visually impaired and acoustically impaired students are much closer to the general pattern. However, it should be noted that Gallaudet College and Rochester Institute of Technology—institutions located in the North Atlantic region having large enrollments of acoustically impaired students—were not selected in the NCES sample.

The movement to make campuses program accessible to the handicapped raises a question: can our colleges and universities house the increased numbers of handicapped expected to enroll as a result of Section 504? The NCES study found that of the 2,071,000 beds on campuses today, 167,300 of them can accommodate mobility impaired students.[1] This is more than five times the number of mobility impaired students currently enrolled. However, a closer look reveals that almost half of the institutions which have dormitory facilities already have more mobility impaired students than they

[1] "Beds which can accommodate mobility impaired students" refers to beds located in buildings and rooms which are physically accessible and from which a student has access to toilet and bath facilities which can accommodate mobility impaired students.

Chart 10.–Enrollment patterns of mobility impaired, visually impaired and acoustically impaired individuals, by control and type of institution



can properly house. Another 22.5 percent can accommodate only the number of mobility impaired individuals that they have enrolled currently (table 11). Hence, despite the excess of beds available which could accommodate the mobility impaired, only 582 institutions could properly house more mobility impaired students than they have enrolled currently.

In summary, the evidence indicates that access for the handicapped–and particularly for the mobility impaired–is currently limited by architectural barriers. Currently, mobility impaired students are disproportionately enrolled in public 2-year institutions, institutions which are now significantly more accessible than other institutions and which are predominantly nonresidential. As our Nation's colleges and universities make their programs more accessible to the handicapped, perhaps this pattern will shift.

Chart 11.–Enrollment patterns of mobility impaired, visually impaired and acoustically impaired individuals, by region of institution

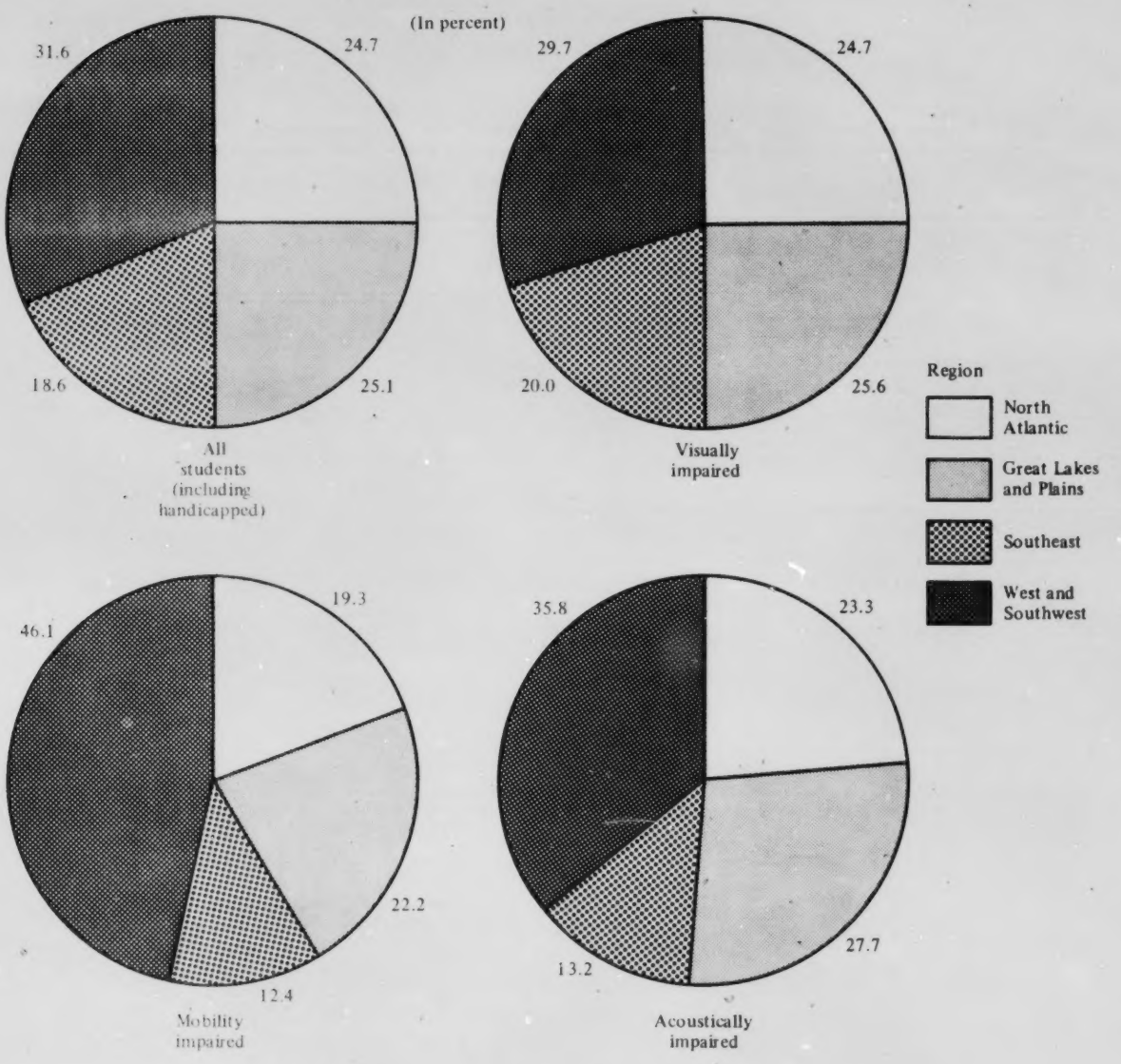


Table 9.—Number and percent of mobility impaired, visually impaired and acoustically impaired individuals enrolled in Fall 1978, by control and type of institution

Control and type	Total enrollment*	Mobility impaired		Visually impaired		Acoustically impaired	
		Enrolled	Percent	Enrolled	Percent	Enrolled	Percent
All institutions							
Total	11,354,756	32,721	0.29	13,745	0.12	11,256	0.10
Universities	2,802,796	6,142	0.22	2,574	0.09	1,872	0.07
Other 4-year	4,468,809	10,260	0.23	5,096	0.11	3,017	0.07
2-year	4,083,151	16,319	0.40	6,075	0.15	6,367	0.16
Public institutions							
Total	8,853,632	29,810	0.34	11,499	0.13	9,805	0.11
Universities	2,081,753	5,528	0.27	2,116	0.10	1,594	0.08
Other 4-year	2,852,655	8,559	0.30	3,580	0.13	1,986	0.07
2-year	3,919,224	15,723	0.40	5,803	0.15	6,225	0.16
Private institutions							
Total	2,501,124	2,911	0.12	2,246	0.09	1,451	0.06
Universities	721,043	614	0.09	458	0.06	278	0.04
Other 4-year	1,616,154	1,701	0.11	1,516	0.09	1,031	0.06
2-year	163,927	596	0.36	272	0.17	142	0.09

Note:—Includes both full-time and part-time enrollments.
*Source: National Center for Education Statistics, *Fall Enrollment in Colleges and Universities, 1978 (Preliminary Estimates)*

Table 10.–Number of mobility impaired, visually impaired and acoustically impaired individuals enrolled in institutions of higher education in Fall 1978, by control, type and region of institution

A. North Atlantic Region

Control and type	Number of institutions	Mobility impaired	Visually impaired	Acoustically impaired
All institutions				
Total	868	6,304	3,396	2,625
Universities	46	1,250	722	388
Other 4-year	563	2,338	1,424	885
2-year	259	2,716	1,250	1,352
Public institutions				
Total	301	4,614	2,285	1,803
Universities	14	878	415	189
Other 4-year	119	1,529	740	333
2-year	168	2,207	1,130	1,281
Private institutions				
Total	567	1,690	1,111	822
Universities	32	372	307	199
Other 4-year	444	809	684	552[1]
2-year	91	509	120	71

[1]Gallaudet College and Rochester Institute of Technology were not in the NCES sample.

B. Great Lakes and Plains Region

Control and type	Number of institutions	Mobility impaired	Visually impaired	Acoustically impaired
All institutions				
Total	826	7,254	3,514	3,117
Universities	45	1,791	859	842
Other 4-year	487	2,114	1,396	958
2-year	294	3,349	1,259	1,317
Public institutions				
Total	366	6,883	3,082	2,914
Universities	31	1,731	800	819
Other 4-year	91	1,809	1,041	796
2-year	244	3,343	1,241	1,299
Private institutions				
Total	460	371	432	203
Universities	14	60	59	23
Other 4-year	396	305	355	162
2-year	50	6	18	18

Table 10.–Number of mobility impaired, visually impaired and acoustically impaired individuals enrolled in institutions of higher education in Fall 1978, by control, type and region of institution

C. Southeast Region

Control and type	Number of institutions	Mobility impaired	Visually impaired	Acoustically impaired
All institutions				
Total	690	4,069	2,757	1,487
Universities	28	649	397	250
Other 4-year	376	1,962	1,115	557
2-year	286	1,458	1,245	680
Public institutions				
Total	366	3,560	2,374	1,323
Universities	21	602	363	219
Other 4-year	128	1,581	900	472
2-year	217	1,377	1,111	632
Private institutions				
Total	324	509	383	164
Universities	7	47	34	31
Other 4-year	248	381	215	85
2-year	69	81	134	48

D. West and Southwest Region

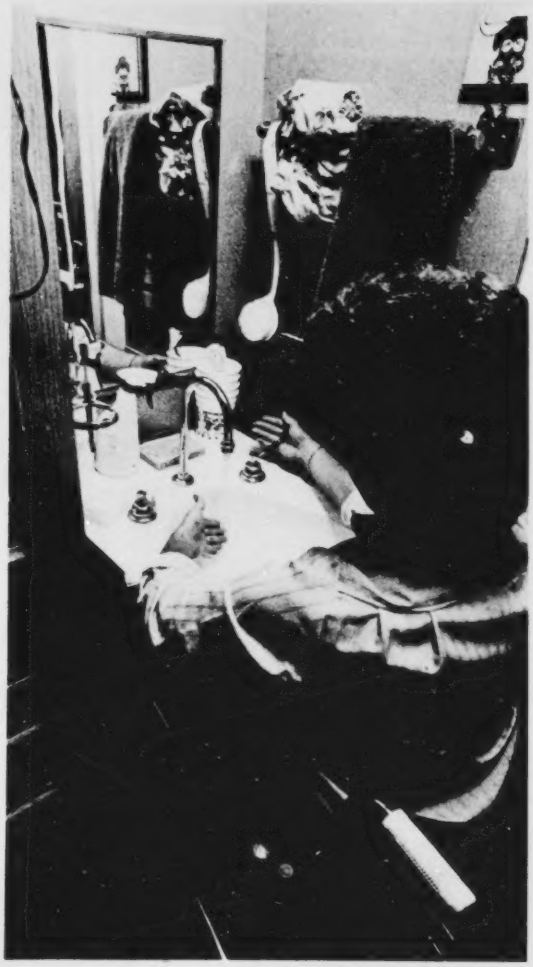
Control and type	Number of institutions	Mobility impaired	Visually impaired	Acoustically impaired
All institutions				
Total	699	15,094	4,078	4,027
Universities	41	2,452	596	392
Other 4-year	343	3,846	1,161	617
2-year	315	8,796	2,321	3,018
Public institutions				
Total	430	14,753	3,758	3,765
Universities	29	2,317	538	367
Other 4-year	111	3,640	899	385
2-year	290	8,796	2,321	3,013
Private institutions				
Total	269	341	320	262
Universities	12	135	58	25
Other 4-year	232	206	262	232
2-year	25	0	0	5

Table 11.—Ability of institutions of higher education to house mobility impaired students currently enrolled, by control and type of institution

	Number	Shortage of beds*			No shortage or excess	Excess of beds*			No housing facilities
		50+	10-49	1-9		1-19	20-49	50+	
All institutions									
Total	3,083	43	142	397	460	353	155	498	1,035
Universities	160	18	23	19	1	19	14	66	0
Other 4-year	1,769	18	76	327	371	236	95	360	286
2-year	1,154	7	43	51	88	98	46	72	749
Public institutions									
Total	1,463	43	124	123	74	99	58	171	771
Universities	95	18	15	8	1	6	8	39	0
Other 4-year	449	18	66	77	42	40	12	112	82
2-year	919	7	43	38	31	53	38	20	689
Private institutions									
Total	1,620	0	18	274	386	254	97	327	264
Universities	65	0	8	11	0	13	6	27	0
Other 4-year	1,320	0	10	250	329	196	83	248	204
2-year	235	0	0	13	57	45	8	52	60

*Beds located in buildings and rooms which are physically accessible and from which a student has access to toilet and bath facilities which can accommodate mobility impaired persons.

Methodology



University of Texas at Austin

This study employed a two-stage approach. The first consisted of a survey that NCES administered through an established network of State agencies to a stratified random sample of 700 colleges and universities. (The survey instrument is reproduced in appendix A.) In the second stage, specially trained State personnel conducted on-site audits of 138 of the original 700 institutions. The results of the second stage investigation were used to adjust the data reported by the institutions in the first stage.

The Survey Instrument

The survey instrument used in the first stage of the study is a modified version of an instrument which has been administered to American colleges and universities periodically since 1968. The terms and definitions are taken from the *Facilities Inventory and Classification Manual, 1973.* The modifications incorporating information on accessibility and renovation costs associated with Section 504 were developed by staff members of NCES and the Office for Civil Rights. In addition, knowledgeable members of the higher education community and handicapped persons, upon request, consulted extensively with NCES (appendix D).

To maximize the accuracy of the data supplied to NCES, the survey instrument directed the institutions to base their responses on the transition plan required by Section 84.22(e) of the regulations implementing Section 504. Each recipient was required to complete this transition plan by December 2, 1977. At a minimum, the plan had to contain the identification of all physical obstacles in the recipient's facilities which limit program accessibility to the handicapped. It also had to contain a detailed description of the method the recipient would use to make the facilities program accessible.

The actual survey instrument consists of four parts (appendix A). *Part A – The Building Inventory* shows by age groups the total gross and assignable area, the amount of assignable area physically accessible, the amount of inaccessible area and, of that, the amount of inaccessible area which will be made accessible in order to comply with Section 504. This part also provides the estimated costs of these modifications as well as the total estimated cost of implementing the institution's transition plan. *Part B – Estimated Enrollment of Mobility, Visually, and*

Acoustically Impaired Students shows data as of the beginning of the Fall 1978 term. *Part C – Student Capacity of Institutionally Owned or Operated Housing* shows the number of students and mobility-impaired students that can be accommodated by campus residences. *Part D – Accessibility by Room Use Categories* shows by designated room-use categories the assignable square footage of accessible and inaccessible space and the amount of the inaccessible space which will be made accessible in order to comply with Section 504.

NCES mailed the questionnaire in September 1978 to the 700 sample institutions. They were instructed to return the completed form to their State coordinator, who manually edited the data. The edited forms were then sent to Higher Education Facilities Services, Incorporated, with which NCES had contracted to process the data. The contractor also manually edited the forms, transferred the data to magnetic tape, and machine-edited the data before accepting it for further processing. Edit failures were jointly resolved by the contractor, the institution and the NCES survey director.

The Site Visit

The key to developing accurate cost estimates lay with the on-site validation stage of the study. For several reasons, the initial cost figures supplied by the institutions might have contained inaccuracies. First, and most importantly, the transition plan upon which the cost estimates were to be based had to be developed before self-evaluation guides were available to help the institutions apply the actual requirements of Section 504. Without such guidance, many institutions incorrectly interpreted Section 504, believing it required a "barrier free" campus. A second source of potential errors was the short amount of time institutions were given in which to respond to the survey. This restriction might have limited the care with which they scrutinized their own estimates. Finally, since Congress could use this study as a basis for a bill to support institutions financially, the possibility of institutional bias could not be discounted.

To validate the information reported by the institutions, NCES followed up a subsample of the original 700 institutions with a site visit. This stage of the study had several objectives:

- To provide an impartial evaluation of the renovation costs necessitated by Section 504;
- To validate the actual figures reported by the institutions to NCES;
- To determine causes of data variation and correct the data where appropriate;
- To collect data on a subsample of non-responding institutions and institutions for which data were imputed; and
- To provide limited technical assistance to the institutions by showing them alternatives to structural modification or ways that modifications can be accomplished less expensively.

The methodology employed in the site visits was carefully developed by a small task force. The group's most important task was to develop objective standards by which accessibility and related modification costs could be measured. While the regulations implementing Section 504 did not specify any standards for existing facilities, it was essential to this study that standards be developed to assure uniformity. The standards which were adopted (appendix C) could best be described as "modified" American National Standards Institute (ANSI) standards.[1] While the regulations require all new facilities to meet ANSI standards, these standards had to be modified to be applied reasonably (from a cost standpoint) to existing structures. To assure that they conformed with the intent of the regulations, NCES developed these modified ANSI standards in conjunction with the Office for Civil Rights. OCR approved them with the understanding that they were to be used for this study only.

In addition to the standards for determining accessibility, the task force developed standard costs for most types of structural modification which would be required. The cost standards were based on average labor and material costs as of January 1, 1979, although the site visit teams were permitted to make reasonable adjustments to reflect local and regional cost variations. If an institution had a firm cost estimate for a required modification, site visit teams were instructed to use the institutional estimate.

To minimize the burden on the institutions being visited, the site visits were designed to be completed in three days or less. A separate methodology permitting sampling of the buildings to be inspected was developed for large institutions (those with over one million square feet of building space) where one could not reasonably examine every building within three days. To further expedite this stage of the study, NCES specified that enough auditors must be trained so that no team would have to conduct more than three site visits. The teams themselves consisted of at least two persons, one or more of whom must have attended an NCES training session. (See appendix E for a list of auditors.)

NCES conducted three 3-day training sessions in January and February 1979. During the first two and a half days, the auditors reviewed and discussed the regulations and studied the survey instrument and the additional forms to be filled out. They were also trained in

[1] "American National Standard Specifications for Making Buildings Accessible to, and Usable by, the Physically Handicapped" (ANSI A117.1), American National Standards Institute, Inc., New York, 1961 (revised 1971).

interview techniques and the site visit methodology to be employed. During the final half day, the teams actually conducted a site visit audit of an institution to assure that they understood what was to be done and that they applied the standards consistently.

After completing the training session, the auditors returned to their home States and initiated the site visits. The first step was to contact the institution to be visited, requesting permission to conduct the visit and setting the time for an introductory meeting. During that meeting, the auditor reviewed part A of the original facilities inventory (appendix A) with the institution's business officer, physical plant administrator, and one or more members of the academic and student services staff.

Four forms were to be completed at this first meeting (appendix B). *Facilities Inventory Form – One* required the listing of each building that the institution had indicated in its initial response to NCES was accessible to the mobility impaired. *Facilities Inventory Form – Two* was used to list each building containing space which the institution intended to make accessible in order to comply with Section 504. After these two forms were completed, the auditors checked the assignable-square-footage figures to assure that the totals corresponded with those sent to NCES.

The two remaining forms were designed to assure that the institution had indeed considered all aspects of program accessibility in its response. The first of these forms is the *Student Services Inventory/Evaluation Form.* The list of student services represents those most commonly found on college campuses. For each category of student service, the institution was asked to indicate the building in which that service was located. If that building appeared in either *Facilities Inventory Form – One* or *Facilities Inventory Form – Two,* the "accessible" column was checked. Otherwise, the "not accessible" column was checked. In the latter case, the campus officials were asked to explain why the affected service was not accessible or to be made accessible. If the building had been inadvertently omitted from one of the earlier forms, it was then added to the appropriate form.

The same process was employed for the *Academic Program Inventory/Evaluation Form.* This form did not contain an exhaustive listing of all academic programs, but rather contained a preselected sample of programs and classes. It was felt that these programs were sufficiently representative to indicate whether or not the institution had carefully thought through its needs with respect to program accessibility as it relates to academic programs.

After the four forms were completed and reviewed, the audit teams inspected each building identified on the inventory forms. In surveying each of the facilities, the team actually measured such features as ramp inclines, door openings, restrooms and drinking fountains. Particular attention was paid to the proposed installation of elevators, since this is such a high-cost item. The campus administrators were asked to describe, in terms of program accessibility, each multi-level access requiring the installation of an elevator.

The final task in the site visit was an exit interview. During this interview, the audit teams discussed their findings with the campus officials and told them what information was being forwarded to NCES. The teams closed the interview by assuring the officials that the data were not being collected for complaince purposes and that the officials were not bound to accept the audit findings.

The Sample Design

The first stage sample was obtained from the institutions in the NCES *Education Directory 1977-1978: Colleges and Universities.* The institutions were stratified by control (public or private), type (university, other 4-year, 2-year), and region (North Atlantic, Great Lakes and Plains, Southeast, West and Southwest), enabling tabulations to be produced for each of these cells. Within each of the six type and control categories, the institutions were arranged by region and ordered on the basis of the size of the square root of the total assignable space of the institution in the following manner[1]:

Region	Order
1	Descending (high to low)
2	Ascending (low to high)
3	Descending (high to low)
4	Ascending (low to high)

The total assignable square footage figures were obtained from the 1974 NCES *Inventory of College and University Physical Facilities.*

Using the square root of the total assignable space as a measure of size, 15 public and 3 private universities were sufficiently large that NCES included them in the sample with certainty. The remaining 3,065 institutions were divided into 341 zones, with each zone having approximately the same sum of the square roots of the total assignable space of the institutions in the zone. Within each zone, two institutions were selected at random for the sample (table B).

A stratified random subsample of 138 institutions was selected for the second stage of the study. A different approach was employed in selecting the institutions

[1]The strategy of ranking the sampling units in this manner and selecting two units per zone was developed by Nathan Keyfitz ("Estimates of sampling variance where two units are selected from each stratum," Journal of the American Statistical Association, vol. 52, 1957: pp. 503-510). This design yields a variance formula (shown in the next section of this report) which is extremely simple to apply.

Table B.–Number of institutions in the survey sample, by control and type

Control and type	All institutions	Institutions in the sample		
		Certainty institutions	Non-certainty institutions	Total institutions
Total	3,083	18	682	700
Public				
University	95	15	60	75
Other 4-year	449	0	156	156
2-year	919	0	148	148
Private				
University	65	3	36	39
Other 4-year	1,320	0	254	254
2-year	235	0	28	28

to be included in the on-site validation study. Each institution for which a response had been received for the initial survey was ranked by estimated cost per assignable square foot of space. This figure was calculated by dividing the total cost of modifications (part A, line 8, column 6 of the survey instrument) by the total assignable square feet (part A, line 8, column 2). Three strata were then formed, with the top 20 percent of the institutions in the first stratum, the middle 60 percent in the second stratum, and the lowest 20 percent in the third stratum. A fourth stratum was created by grouping all of the nonresponding institutions. A sample of 40 institutions was then randomly selected from each of the first three strata, and a sample of 18 nonrespondents was selected at random from the final stratum.

NCES closely coordinated the sample design and selection with the Office of the Assistant Secretary for Planning and Evaluation (ASPE) of HEW, since that office was conducting a study of the impact of Section 504 on *all* eligible recipients. Both agencies agreed to use the initial NCES survey data as the starting point for developing cost estimates for the higher education sector. ASPE also adopted the NCES subsample design for the second stage of their study, which used a different methodology from the NCES site visit approach.[1] To minimize the number of institutions asked to participate in both studies, while leaving a sufficient overlap to evaluate the effect of the differing methodologies, NCES drew the sample for both agencies in a manner which assured an overlap of exactly six institutions in each of the first three strata (table C).

Adjustments to the Data and Computational Procedures

[NOTE: This section of the report is highly technical and is included for the benefit of the researchers and analysts. Readers not interested in the actual methodology may wish to skim or skip this section, although users of the data should be aware of what adjustments were made to the institutional responses.]

[1] The ASPE study used group conferences rather than site visits. Institutional representatives were invited to one-day conferences at which the participants discussed their understanding of Section 504 and the particular problems they were encountering. Alternate solutions were discussed, with a particular emphasis on avoiding structural modifications. (Note that in many cases, this strategy results in lower construction costs than the NCES study would have identified, but at the expense of higher annual operating expenses. An example of this difference is the case of an Eastern university with two libraries–one general library and one special education library. The NCES study included costs for making both libraries accessible; the ASPE evaluator determined that the university should catalog all of the special education library's books in the main library and employ "runners" to obtain any special education book desired by a mobility impaired individual.) One other methodological difference is that the ASPE study did not utilize fixed standards for physical accessibility. Rather the ASPE study employed a "functional" standard, meaning that if the institutional officials felt that a mobility impaired person was "reasonably capable" of accessing the space, then the space was specified as being accessible.

Table C.–Distribution of the sample for stage two

Cost stratum	Stage one	Stage two sample				
	NCES and ASPE	NCES total	NCES only	NCES and ASPE	ASPE only	ASPE total
Total	700	138	120	18	42	60
Upper 20%	112	40	34	6	14	20
Middle 60%	336	40	34	6	14	20
Lower 20%	112	40	34	6	14	20
Nonresponding institutions	140[1]	18	18	0	0	0

[1]Forty-seven institutions, listed as nonrespondents at the time the second stage samples were drawn, subsequently responded and were included in the final calculation of national estimates.

Before the final data tables were generated, several types of adjustments were applied to the data. Separate adjustments were made for :

- Nonresponse
- Cost corrections based on the on-site evaluation findings
- Square footage corrections to minimize the sampling effects
- Accessibility corrections based on the on-site evaluation findings
- Nonresponse/imputation bias

The methodology employed for making each type of adjustment is described below.

To calculate the sampling error using the Keyfitz method, it is necessary to have data from both institutions in each noncertainty zone. Therefore, data had to be imputed for nonresponding institutions. In the event that an institution did not respond to the original survey, one of two actions was taken. First, if two institutions in two adjacent zones (either two institutions in the same zone or one institution in each of the two zones) did not return their survey instruments, then the two zones were collapsed into a single zone. Second, in the case where a single institution in a zone did not respond and there was no adjacent zone with a single nonrespondent, cost figures were imputed for the nonresponding institution.

Imputed values for total space to be made accessible (part A, row 8, column 5) and total estimated cost of the modifications (part A, row 8, column 6) were derived from the responses of the two institutions ahead of the nonrespondent and the two institutions following it. (Recall that, within each type and control category, the institutions were ordered on the basis of their assignable space).

More specifically, if the value for the ith institution in any type and control category was to be imputed, where

X_i = the value of the ith institution in the sample; and

t_i = the square root of the total assignable space (from the 1974 inventory) of the ith institution,

then the imputed value for X_i, denoted by X_i^*, is given by

$$X_i^* = (X_{i-2} + X_{i-1} + X_{i+1} + X_{i+2})\, t_i / (t_{i-2} + t_{i-1} + t_{i+1} + t_{i+2}).$$

Once values had been imputed for columns five and six of the eighth row of part A, the entries for the remaining entries in row 8 were generated from the data provided by the responding institution in the same zone as the nonresponding institution. If

X_i = the ith value of row 8 for the responding institution;

Y_5 = the imputed value for row 8, column 5 of the nonresponding institution; and

Y_i = the ith value of row 8 to be imputed for the nonresponding institution,

then the imputed value, Y_i, is given by

$$Y_i = (X_i)(Y_5/X_5).$$

The imputed values for the remaining rows of part A were also based on the data provided from the responding institution in the same zone as the nonresponding institution. For each column, the imputed total was distributed over the year-of-construction categories in the same proportion as the responding institution's corresponding column total.

Because imputing for nonresponse may introduce a bias into the results, a special study of the bias was conducted. This is discussed later in this section.

After all nonresponse adjustments had been applied, the cost figures for each institution were adjusted to reflect the on-site evaluation findings. Recall that the institutions had been stratified into four groups following receipt of their initial survey data. The first stratum contained the 112 institutions (20 percent of the number of institutions that had responded at the time the second stage sample was drawn) that had reported the highest cost per total assignable square foot. The second stratum contained the middle 336 institutions based on cost per total assignable space, and the third stratum contained the lowest 112 institutions (virtually all of which reported no cost). Institutions which responded between the time that the second stage sample was drawn and the time that the cost adjustments were made were added to the appropriate stratum based on their reported cost per total assignable square foot. The fourth stratum contained the remaining nonresponding institutions. As described above, cost data were imputed for the institutions in the fourth stratum.

For each of the first three strata, two cost adjustment factors were generated from the data reported from the site visits of those institutions in the second stage subsample--one each for public and private institutions. The adjustment factors for the first two strata (high and medium cost institutions) were calculated in a similar manner. Without loss of generality, the derivation will only be presented for publicly controlled high-cost institutions. Let

X_{hj} = the cost reported by the institution for the jth publicly controlled high cost institution from the original sample which is also in the subsample, where h represents the original zone of the institution;

Y_{hj} = the corresponding cost as reported by the site visit evaluator for the jth institution;

N_h = the number of institutions in the hth zone;

n_h = the number of sample institutions in hth zone ($n_h = 1$ for certainty zones, $n_h = 2$ for non-certainty zones); and

$f_h = n_h/N_h$.

Then the adjustment factor for publicly controlled high-cost institutions, denoted by b_{11}, is given by:

$$b_{11} = (\Sigma_j Y_{hj}/f_h)/(\Sigma_j X_{hj}/f_j).$$

Similar computations are used to derive the adjustment factor for privately controlled high-cost institutions (b_{12}), as well as for the two adjustment factors for medium-cost institutions (b_{21} and b_{22}, respectively).

The original response from each institution in the first two strata is then adjusted as follows: if X_{hi} represents the original datum from the ith institution in the hth zone, then the adjusted value for that institution, denoted by X^*_{hi}, is given by

$$X^*_{hi} = \begin{cases} b_{11} X_{hi}, \text{ if the institution is publicly controlled high-cost;} \\ b_{12} X_{hi}, \text{ if the institution is privately controlled high-cost;} \\ b_{21} X_{hi}, \text{ if the institution is publicly controlled medium-cost;} \\ b_{22} X_{hi}, \text{ if the institution is privately controlled medium-cost.} \end{cases}$$

For the low-cost stratum, a different strategy had to be employed, since most of the reported cost values were zero. For institutions in this stratum, the adjustment factor was derived in terms of cost divided by the square root of the total assignable space. More specifically, let

Y_{hj} = the site visit datum for the jth publicly controlled low-cost institution in the subsample; and

t_h = the square root of the total assignable space (taken from the 1974 inventory) for the hth zone.

Then the adjustment factor for publicly controlled low-cost institutions, denoted by b_{31}, is given by

$$b_{31} = (\Sigma_j Y_{hj}/f_h)/(\Sigma_j t_h/n_h).$$

A similar procedure yields b_{32}.

The original response from each institution in the third stratum (low cost) was then revised as follows: if t_{hi} represents the square root of the total assignable space from the 1974 inventory for the ith institution in the hth zone, then the revised datum for that institution, denoted by X^*_{hi}, is given by

$$X^*_{hi} = \begin{cases} b_{31} t_{hi}, \text{ if the institution is publicly controlled} \\ b_{32} t_{hi}, \text{ if the institution is privately controlled.} \end{cases}$$

The imputed cost data for the institutions in the fourth stratum were then recalculated as described earlier, this time using the adjusted cost figures from the responding institutions. This completed the adjustments to the data which were applied *before* national and regional estimates were generated. Other adjustments, which were applied *after* the sample data had been weighted and aggregated to form national and regional estimates, are described later in this section.

Once the data for each institution in the sample had been adjusted or imputed, population estimates were determined by inflating the sample data from an institution by the inverse of that institution's probability of selection. For certainty institutions, this factor is one; for other institutions, the factor is the inverse of the sampling fraction for the zone in which the institution lies.

More specifically, using the notation from above and letting

X^*_{hi} = the adjusted or imputed datum for the ith institution in the hth zone (For certainty zones, $X^*_{h2} = 0$, since there is only one institution in the zone.),

then the adjusted population estimate, denoted by X^*, is given by

$$X^* = \sum_h [(X^*_{h1} + X^*_{h2})/f_h].$$

The sampling variance of the estimate, denoted by S^2_x, is then given by

$$S^2_x = \sum_h (1 - f_h)[(X^*_{h1} - X^*_{h2})/f_h]^2.$$

Finally, the coefficient of variation, which reflects the relative sampling error of the estimate, is given by

$$C.V. = \sqrt{S^2_x}/X^*.$$

One of the most important indicators of the economic impact of Section 504 is the cost per assignable square foot of space. The cost figures were adjusted before national and regional estimates were made, but no corresponding adjustments were applied to the space data. Therefore, after the national and regional estimates were established for each control and type of institution, two adjustments were applied to the space estimates.

The first adjustment consisted of multiplying each space estimate in the first six rows (corresponding to space constructed prior to 1975) by a sample control factor. For each type and control category, a sample control factor was calculated by dividing the total assignable square feet figures from the 1974 *Facilities Inventory* by the corresponding estimate based on the 1978 sample. (The corresponding estimate is the sum of the first six rows of column 2 of part A.) This adjustment accomplished two things. First, it adjusted for space which the sample institutions had improperly included or excluded. Second, it removed much of the inaccuracy in the total space which could have resulted if the random selection process had selected larger (or smaller) institutions of a given type and control disproportionately in each zone.

The second adjustment to the space figures affected the space which the institutions had reported as accessible, inaccessible, and to be made accessible (columns 3, 4 and 5 of part A). The on-site auditors found that the institutions had frequently overestimated the amount of space figures that was accessible, resulting in underestimates of the corresponding figures in columns 4 and 5. The reported accessible space figures were found to be quite accurate in the high cost stratum, somewhat underestimated in the middle stratum, and grossly underestimated in the low-cost stratum (where most of the institutions reported no inaccessible space).

The accuracy of the figures in columns 3 through 5 varied so much from one campus to the next that an institution by institution adjustment was rejected. Instead, the national estimates for each type and control category were adjusted in the following manner. For a given type and control category, let

N_{ij} = number of institutions of control i and type j; and

n_{ij} = number of institutions of control i and type j represented by the sample institutions in the low-cost stratum. (For non-certainty institutions, an institution in the sample from the hth zone represents $N_h/2$ institutions nationally, where N_h is the number of institutions in the hth zone. Certainty institutions represent themselves only.)

The estimate of the total space to be made accessible was then adjusted by multiplying the original estimates for each year of construction category by $N_{ij}/(N_{ij} - n_{ij})$.

The site visit results indicated that 90 percent of this increased space which had to be made accessible was space which had been incorrectly reported by the institution as accessible space. The remaining 10 percent was space which the institution had correctly identified as inaccessible, but which the institution did not believe had to be made accessible. Therefore 90 percent of the difference [equal to $(0.9)(n_{ij})/(N_{ij} - n_{ij})$ times the original estimate for total space to be modified] was subtracted from the accessible-space estimate and added to the

inaccessible-space estimate. This change was prorated over the respective year of construction categories.

The final adjustment made was to correct the cost estimates for nonresponse/imputation bias. A site visit evaluation of fourteen of the institutions which did not respond to the initial survey indicated that the imputed cost figures overestimated the actual cost by 12.3 percent. To adjust for this bias, the proportion of the cost which was based on imputed data (including those institutions for which zones were collapsed) was reduced by 12.3 percent. This adjustment was applied separately for each type and control category in each region. The total cost figure was only reduced by 1.4 percent by this adjustment (see table D in the next section).

Quality of the Data

Lane Community College, Eugene, Oregon

Any study which involves the collection of data from a sample of a given population is vulnerable to potential errors of two kinds. One involves potential sampling error. When data are collected from less than the total population of interest, the sample may not truly represent all institutions in the universe. Other factors, such as nonresponse, interviewer differences, unclear definitions, and respondent mistakes, introduce a second source of potential error known as nonsampling error. The NCES study was carefully designed to minimize both forms of error. The degree to which these design efforts were successful is discussed in the following sections.

Sampling Error

Any time a value is estimated on the basis of a sample of data, the estimated value depends upon the actual sample that was drawn. Different samples will generally yield different estimates for the same parameter. The degree to which these different estimated values vary from one another is measured by the sampling error. The size of the sampling error depends upon the characteristics of the population and the size of the sample. Generally, the larger the sample is, the smaller the sampling error will be for a given sample design.

The size of the sampling error relative to the estimate itself is called the relative error or the "coefficient of variation" and is usually stated as a percentage. The NCES sampling plan and selection of a sample size were designed to keep the coefficient of variation for the national estimate of cost under 7.0 percent. In addition, the design was intended to keep the relative error under 10.0 percent for regional estimates of total cost.

The degree to which a sample design is successful in minimizing the coefficient of variation largely depends upon the response rate. A sampling plan designed to assure a low coefficient of variation can completely fail if an adequate response rate is not attained. (Nonresponse also introduces a potential bias. This is discussed in the next section.) The NCES study was successful in obtaining a response rate of 86.7 percent in the first stage of the study and a response rate of 87.7 percent in the second stage (the site visits). (Table 12 shows the sample sizes and actual response rates.)

The overall response rate led to a national coefficient of variation of 3.4 percent. This corresponds to a standard error of $18,859,100, which means that we are

95 percent confident that the true cost (as defined by the constraints of the study design) is between $524,044,500 and $597,972,200. The regional coefficients of variation for total cost ranged from 4.7 percent to 8.7 percent (table 13).

Coefficients of variation were also calculated for the number of mobility impaired, visually impaired and acoustically impaired students enrolled in American colleges and universities. These coefficients were generally larger than the coefficients of variation for the cost data, but they were still under 8.0 percent for national totals and under 16.0 percent for totals by control of institution (tables 14, 15 and 16).

With coefficients of variation this small, it becomes especially important to examine the various sources of nonsampling error. This is done in the next section.

Table 12.—Sample sizes and response rates for the two stages of the NCES study

A. Stage one sample

Control and type	Sample size	Respondents[1]	Response rate[1]
Total	700	607	86.7
Public			
University	75	69	92.0
Other 4-year	156	143	91.7
2-year	148	137	92.6
Private			
University	39	32	82.1
Other 4-year	254	201	79.1
2-year	28	25	89.3

B. Stage two sample

Cost stratum	Control	Sample size	Respondents[1]	Response rate[1]
Total		138	121	87.7
High	Public	15	13	86.7
	Private	25	25	100.0
Medium	Public	22	19	86.4
	Private	18	14	77.8
Low	Public	26	23	88.5
	Private	14	13	92.9
Nonresponse	Combined	18	14	77.8

[1] Does not include returns which arrived too late to be used.

Table 13.—Coefficients of variation for total cost associated with Section 504, by control, type and region of institution

Control and type	Total United States	North Atlantic	Great Lakes and Plains	Southeast	West and Southwest
All institutions					
Total	3.4	5.5	8.7	5.4	4.7
Universities	2.7	7.4	4.6	5.8	3.5
Other 4-year	5.2	6.7	13.9	7.9	7.7
2-year	8.0	19.3	9.8	14.7	11.4
Public institutions					
Total	2.7	8.5	3.6	5.1	5.1
Universities	2.6	6.3	4.3	6.3	4.2
Other 4-year	4.1	8.7	6.8	7.8	9.4
2-year	8.9	24.4	9.4	15.9	11.9
Private institutions					
Total	6.9	7.2	18.5	12.3	10.2
Universities	7.5	12.0	17.8	15.3	3.3
Other 4-year	8.5	8.9	21.3	14.4	12.8
2-year	17.9	29.5	30.4	34.1	32.1

Table 14.—Coefficients of variation for numbers of mobility impaired individuals enrolled in institutions of higher education in fall 1978, by control, type and region of institution

Control and type	Total United States	North Atlantic	Great Lakes and Plains	Southeast	West and Southwest
All institutions					
Total	5.6	12.3	10.5	10.8	9.4
Universities	5.4	11.7	5.8	10.5	11.2
Other 4-year	8.7	20.1	15.7	15.9	15.7
2-year	9.7	22.2	20.1	20.6	14.3
Public institutions					
Total	6.0	14.3	11.0	11.7	9.7
Universities	5.9	14.8	6.0	11.2	11.8
Other 4-year	10.1	29.3	17.8	18.2	16.5
2-year	9.8	21.3	20.2	21.5	14.3
Private institutions					
Total	15.1	24.2	21.1	25.2	16.8
Universities	12.1	18.1	18.3	19.0	20.8
Other 4-year	12.4	18.1	25.3	31.5	24.2
2-year	63.7	74.0	88.2	55.5	0.0

Table 15.–Coefficients of variation for numbers of visually impaired individuals enrolled in institutions of higher education in fall 1978, by control, type and region of institution

Control and type	Total United States	North Atlantic	Great Lakes and Plains	Southeast	West and Southwest
All institutions					
Total	6.3	10.5	11.9	17.4	11.2
Universities	4.6	13.8	3.9	12.9	3.4
Other 4-year	7.6	14.3	15.1	16.0	15.1
2-year	12.5	22.2	28.6	35.6	18.2
Public institutions					
Total	7.2	14.2	13.4	19.8	11.8
Universities	5.1	21.5	3.8	13.8	3.7
Other 4-year	9.3	20.4	19.2	19.3	14.8
2-year	13.0	24.1	29.0	39.1	18.2
Private institutions					
Total	10.0	13.7	16.1	25.6	35.6
Universities	10.6	14.7	24.6	32.2	8.0
Other 4-year	12.9	20.1	18.8	20.3	43.5
2-year	36.9	40.4	65.3	64.9	0.0

Table 16.–Coefficients of variation for numbers of acoustically impaired individuals enrolled in institutions of higher education in fall 1978, by control, type and region of institution

Control and type	Total United States	North Atlantic	Great Lakes and Plains	Southeast	West and Southwest
All institutions					
Total	7.1	14.6	10.2	17.5	14.3
Universities	6.3	12.8	1.9	23.8	22.3
Other 4-year	8.6	18.9	15.8	15.5	15.3
2-year	11.8	25.2	21.1	35.1	18.5
Public institutions					
Total	7.9	19.1	10.7	19.3	15.1
Universities	6.8	12.2	1.9	26.6	23.6
Other 4-year	9.2	18.9	18.1	17.5	11.4
2-year	12.0	26.3	21.4	37.1	18.6
Private institutions					
Total	13.9	20.4	23.7	32.2	32.1
Universities	16.7	22.1	13.0	36.9	36.2
Other 4-year	17.8	28.1	28.8	29.7	36.0
2-year	47.2	67.8	64.8	93.5	89.4

Nonsampling Error

Realizing the potential danger of nonsampling error in a new survey, NCES was careful in designing the study to incorporate several safeguards against this form of error. One was to use a modified, existing NCES survey rather than develop a totally new survey instrument. Most State and institutional personnel have had experience with the NCES form and its terms and definitions. Through this familiarity, OCR and NCES sought to reduce the error which usually accompanies the introduction of new definitions into a survey. This same reason prompted the agencies to adopt modified ANSI standards for determining physical accessibility. In general, the less judgment left to the respondents and interviewers, the less nonsampling error is likely to enter into the results.

The one new set of terms and definitions introduced was associated with program accessibility. In order to minimize the misinterpretations of Section 504 requirements, the cover letter (appendix A) contained excerpted explanations from the regulations.

Interviewer difference is another frequent source of nonsampling error in survey studies. NCES used over 100 persons in auditing the reported data, but several precautions were taken to minimize the amount of interviewer difference which would be expected to result. As stated earlier, every site visit team was required to have two or more members, with at least one having attended an NCES training conference. This permitted the members of the team to check each other's findings with at least one person representing the explicit directions of NCES beyond the instructions and standards in the Study Workbook (appendix C) issued to each team. As an additional safeguard, the NCES Survey Director carefully reviewed each site visit report submitted by the audit teams to assure that the standards had been applied properly and uniformly. This was possible because of the extensive detail requested for each type of renovation. Differences in interpretation could thus be identified and, where necessary, corrected.

A third major potential source of nonsampling error in survey studies is bias due to nonresponse. While NCES had an excellent response rate of 86.7 percent to its initial survey, data still had to be imputed for the remaining 13.3 percent of the sample. If these 93 nonresponding institutions had characteristics significantly different from responding institutions, the effect of the nonresponse could be very serious.

To protect against this potentially serious source of error, NCES incorporated a nonresponse study into its overall design. A random sample of 18 nonresponding institutions was selected to be site-visited in order to obtain actual data on them. NCES then compared these data to the imputed data for these institutions. Through this comparison it was evident that the nonrespondents, as a group, were less affected by Section 504 than were the responding institutions. Furthermore, based on the site visit results from the fourteen institutions for whom data were obtained, NCES estimated that the imputed cost estimates for the nonresponding institutions were overestimated by 12.3 percent. This upward bias was subsequently removed from the cost data calculated from the imputed values for the 93 nonresponding institutions. The net effect was that the 13.3 percent of the sample which did not respond to the initial survey was estimated to represent only 11.3 percent of the total cost (table D).

Comparison to 1974 Results

One can obtain a relative assessment of the quality of the data by comparing certain data items from the 1978 survey to the 1974 *Inventory of Physical Facilities*, a complete census of American colleges and universities. While such a comparison includes both sampling and nonsampling effects, the results provide a reasonable assessment of the accuracy of the current data.

For this purpose, three different comparisons were made from the two surveys: total assignable space constructed before 1975; the distribution of total gross area by year of construction before 1975; and total assignable space as a percent of total gross area.

The estimate for total assignable space based on the 1978 sample is 8.9 percent lower than the figure for the same institutions based on data from the 1974 inventory. The relative differences ranged from an underestimate of 16.7 percent for public universities to an overestimate of 9.1 percent for private 2-year institutions (table E). Several factors might account for these differences. First, the site visits revealed that several institutions neglected to report dormitory space in their figures (possibly because dormitory space was not one of the room-use categories listed in part D of the survey instrument). This would partially explain the large underestimate for public universities and private other 4-year institutions.

A second factor is that between 1974 and 1978, buildings constructed before 1975 may have been torn down or sold. Also, some buildings may have undergone major renovations[1] between 1974 and 1978. The survey instructions directed the institution to report the year of construction for such buildings as the date of the most recent major renovation. These latter two factors would lead one to expect the 1978 figures for space constructed prior to 1975 to be less than was reported in the 1974 inventory.

A third factor is the selection of the sample itself. While each zone was designed to contain institutions with approximately the same total assignable space, institutions still varied within each zone. If the sample happened to contain a disproportionate number of smaller

[1] A renovation is defined as major if the cost exceeds 50 percent of the replacement cost of the building at the time of the renovation.

Table D.–Effect of nonresponse, by control and type of institution

Control and type	Percent		
	Nonresponse	Cost imputed[1]	Bias[2]
Total	13.3	11.3	+1.4
Public			
University	8.0	7.5	+0.9
Other 4-year	8.3	5.8	+0.7
2-year	7.4	3.6	+0.4
Private			
University	17.9	12.8	+1.6
Other 4-year	20.9	20.0	+2.5
2-year	10.7	7.7	+1.2

[1] Estimated percent of the total cost for all institutions in the category represented by the nonresponding institutions *after* the bias had been removed.
[2] Bias of cost estimated from inputed data relative to total estimated cost in each category. This bias was removed from the final cost estimates.

Table E.–Total assignable space constructed before 1975, by control and type of institution

Control and type	Total assignable space[1]		Relative difference (percent)
	1974 Inventory[2]	1978 Inventory[3]	
Total	1,336,306,100	1,217,355,100	- 8.9
Public			
University	359,757,600	299,522,900	-16.7
Other 4-year	337,502,000	325,865,900	- 3.4
2-year	150,349,200	143,012,500	- 4.9
Private			
University	138,454,200	132,539,600	- 4.3
Other 4-year	328,270,900	292,452,500	-10.9
2-year	21,972,200	23,961,700	+ 9.1

[1] Measured in assignable square feet (ASF).
[2] Adjusted for new institutions and institutions which closed since 1974.
[3] Based on original data reported to NCES. These figures subsequently were adjusted to agree with the 1974 figures.

(or larger) institutions within a given type and control category, an underestimate (or overestimate) would likely result. This possibility always exists with any sample.

The estimates for square footage in this report were adjusted to reflect the 1974 aggregate figures for each type and control category. The adjustment was made because so much of the analysis of this study lay in comparisons of one type and control category with another (where total assignable space was used as a denominator in the data). In addition, the exact reasons for the differences between the 1974 data and the 1978 data could not be established. This adjustment is described in the Methodology section of this report.

As a second check on the accuracy of the 1978 data (using the 1974 inventory) NCES compared the distribution of total gross area constructed before 1975 by year of construction. The comparison showed the profiles for the two surveys to be very similar (chart 12). This suggests that the institutions made a serious effort to provide accurate data, despite the short time they were given to fill out the questionnaire.

A final quality check was a comparison of the ratio of total assignable space to total gross area for the two surveys, again for space constructed prior to 1975 (table F). The 1974 inventory reported the ratio to be 66.7 percent, compared to 66.8 percent in the 1978 study. Once again, the comparison suggests that the institutions attempted to provide accurate information.

Overall, the evidence indicates that the data in this report are of high quality. While one should not lose sight of the fact that the regulations implementing Section 504 do not specify standards—and are therefore highly subject to differing interpretation—the information in this report should be very useful in gaining insight into the problems surrounding program accessibility.

Chart 12.—Distribution of gross area, by year of construction for space constructed before 1975

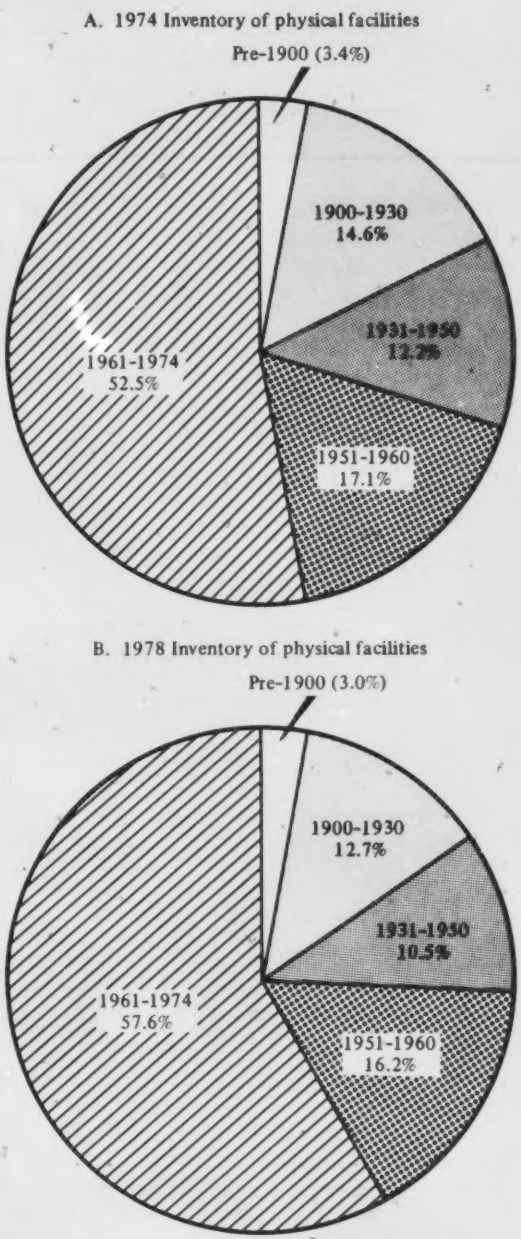


Table F.—Total assignable space as a percent of total gross area for space constructed before 1975; by control and type of institution

Control and type	Percent of total assignable space to total gross area	
	1974 Inventory	1978 Inventory
Total	66.7	66.8
Public		
University	65.1	65.2
Other 4-year	65.6	65.8
2-year	70.6	71.3
Private		
University	65.4	64.1
Other 4-year	68.4	68.5
2-year	70.9	72.5

Institutional Understanding of Section 504's Impact

Colorado State University, Fort Collins

The results from the site visits indicate that most of the institutions well understand how much of their assignable space will have to be physically accessible to achieve program accessibility. Based on the mail questionnaire, they reported that 75.1 percent of their total assignable space would need to be physically accessible; the site visit results showed 75.6 percent (table 17). However, estimates varied widely from one campus to another.

The site visits revealed that the institutions had overestimated the amount of space currently accessible—47.5 percent, compared with 40.7 percent actually accessible. The greatest error was in the data for the private other 4-year institutions, where only 20.5 percent of the space is currently physically accessible compared with a reported figure of 33.0 percent. In each case, the overestimate in space currently accessible was accompanied by an underestimate of the amount of space required to be modified in order to achieve program accessibility.

Despite the increase in space that the site visit indicated would be required, the overall estimate of the cost involved turned out to be significantly lower than that estimated by the institutions themselves. The on-site evaluation teams, using the standards developed for this study, found that many of the modifications proposed were not required by Section 504. In many other cases, the evaluation teams established that less expensive alternatives could be employed. As a result of this cost adjustment, the total cost estimate was reduced from $692 million to the $561 million presented earlier in this report.

Table 17.–Currently accessible space and accessible space needed for program accessibility, by control and type of institution

Control and type	Average percent of total space[1] currently accessible		Average percent of total space[1] needed to be accessible	
	Reported to NCES	Adjusted percentage[2]	Reported to NCES	Adjusted percentage[2]
All institutions				
Total	47.5	40.7	75.1	75.6
Universities	47.3	46.1	72.3	72.4
Other 4-year	41.5	31.6	72.6	73.3
2-year	68.4	58.7	89.9	91.5
Public institutions				
Total	54.6	49.0	80.8	80.9
Universities	49.6	48.5	74.2	74.0
Other 4-year	48.9	42.1	80.3	80.9
2-year	75.3	63.7	94.2	95.5
Private institutions				
Total	35.0	25.9	64.8	65.8
Universities	41.9	40.0	67.9	68.0
Other 4-year	33.0	20.5	63.9	65.2
2-year	19.8	18.3	59.7	60.0

[1]Measured in assignable square feet (ASF)
[2]Percentages adjusted to reflect the on-site evaluation findings

Appendixes

APPENDIX A

Reproduction of the Cover Letter and Survey Instrument

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE ASSISTANT SECRETARY FOR EDUCATION
WASHINGTON, D.C. 20202

NATIONAL CENTER FOR
EDUCATION STATISTICS

To: Colleges and Universities

Dear President:

Your institution has been selected by the National Center for Education Statistics (NCES) as one of 700 colleges and universities included in the national sample for the 1978 Inventory of College and University Physical Facilities. This survey differs from the NCES 1974 facilities survey in a very important respect; it has been designed to provide Congress with an estimate of the cost associated with the renovations required to come into compliance with Section 504 of the Rehabilitation Act of 1973, as amended. Because this data will serve as the foundation for any supplemental budget request to Congress for appropriations to assist institutions, the National Association of College and University Business Officers, the American Council on Education, and other associations are supporting NCES's effort and urging the institutions to complete and return the form by September 30, 1978. The credibility of the cost figures provided will be reinforced through site visits to approximately 20 percent of the institutions in the sample.

The purpose of combining the cost data with a modified update of the facilities is to give HEW an indication of the physical modifications that will be required to achieve program accessibility. The data are expected to yield a "profile" of the physical plant of a program-accessible institution, thereby indicating the typical percentage of plant accessibility for each category of room use that accompanies program accessibility.

At this point, NCES wishes to emphasize that Section 504 requires program accessibility and not building accessibility. This survey is not intended to imply otherwise. To stress this point, the following paragraph is cited from the policy interpretation of Section 504 published in the Federal Register, Volume 43, Number 157 on Monday, August 14, 1978:

The Section 504 regulations were carefully written to require "program accessibility" not "building accessibility," thus allowing recipients flexibility in selecting the means of compliance. For example, they may arrange for the delivery of their services at alternative sites that are accessible or use aides or deliver services to persons at their homes. The regulation does not require that all existing facilities or every part of an existing facility be made accessible; structural changes are not necessary if other methods are effective in making the recipient's services available to mobility impaired persons. For example, a library building in a rural area with one room and an entrance with several steps can make its services accessible in several ways. It may construct a simple wooden ramp quickly and at relatively low cost. Mobility impaired persons may be provided access to the library's services through a bookmobile or by special messenger service or clerical aid or any other method that makes the resources of the library "readily accessible." However, recipients are required to give priority to methods that offer handicapped and nonhandicapped persons programs and activities in the same setting.

Three copies of the questionnaires have been provided. You may keep one copy and should forward the other two completed copies to your State Facilities Commission which is coordinating this survey. This State agency, which has probably contacted you in reference to this survey, will then forward one copy of the form to the Higher Education Facilities Services, Inc. (HEFS) in Raleigh, North Carolina for processing.

Please note that the survey due date is September 30, 1978. This is the date that your completed questionnaire is due at your State agency. The short time span for completion is necessary to insure that Congress receives the cost data by the end of the calendar year. We urgently request your cooperation.

Any questions can be addressed to me (202-472-5757); the project director, Mr. Arthur Podolsky (202-245-8392); to the HEFS project director, Mr. Thomas H. Heath (919-733-3266) or to your State agency.

Sincerely,

Rolf M. Wulfsberg
Acting Director
Division of Postsecondary and
Vocational Education Statistics

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL CENTER FOR EDUCATION STATISTICS
WASHINGTON, D.C. 20202

INVENTORY OF COLLEGE AND UNIVERSITY PHYSICAL FACILITIES

(as of September 15, 1978)

PLEASE READ INSTRUCTIONS BEFORE COMPLETING THIS FORM

OMB NO. 51-S78027
APPROVAL EXPIRES: June 79

1. INSTITUTION CODE NUMBER

2. DUE DATE
Not later than September 30

Items 1, 3, 4, 5, and 6 MUST be completed by all institutions. If applicable, complete items 7 and 8. Submit a separate survey form for each of the campuses or branch campuses of the institution. If it is impossible to provide separate data for any branch campus, and the data for that branch must be included in the parent institution's report, indicate this in item 8 below.

3. NAME AND MAILING ADDRESS OF INSTITUTION OR CAMPUS COVERED BY THIS REPORT *(Include city, State, and ZIP code)*

4. NAME AND TITLE OF RESPONDENT

5. TELEPHONE NUMBER OF RESPONDENT *(Area code, local number and extension)*

6. THE INSTITUTION COVERED BY THIS REPORT IS *(Check only one)*

(a) ☐ A SINGLE-CAMPUS INSTITUTION

(b) ☐ A MAIN CAMPUS *("Parent" institution)* WITH ONE OR MORE BRANCH CAMPUSES AND/OR OTHER CAMPUSES *(Specify in item 8 below)*

(c) ☐ A BRANCH CAMPUS OF A PARENT INSTITUTION *(Write the name of parent institution below)*

(d) ☐ ONE OF THE ADMINISTRATIVELY EQUAL CAMPUSES OF A MULTI-CAMPUS INSTITUTION

7. IF THE INSTITUTION COVERED BY THIS REPORT IS INCLUDED IN AN "INSTITUTIONAL SYSTEM", WRITE THE NAME OF THE SYSTEM BELOW.

8. PARENT INSTITUTIONS *(As checked in item 6b)* SHOULD LIST THE NAMES OF ALL THEIR BRANCH CAMPUSES BELOW. USE THE FIRST COLUMN TO SHOW WHETHER DATA FOR ANY OF THESE UNITS ARE INCLUDED WITH THE DATA FOR THE "PARENT" IN THIS REPORT.

ARE DATA FOR THIS UNIT INCLUDED IN THIS REPORT?	NAME OF BRANCH CAMPUS AND/OR OTHER CAMPUS	ADDRESS *(City, State, and ZIP code)*
☐ YES ☐ NO		
☐ YES ☐ NO		
☐ YES ☐ NO		

DEFINITIONS

MULTI-CAMPUS INSTITUTION. An organization bearing a resemblance to an institutional system, but unequivocally designated as a single institution with either of two organizational structures: *(1)* an institution having two or more campuses responsible to a central administration *(which central administration may or may not be located on one of the administratively equal campuses)* or *(2)* an institution having a main campus with one or more branch campuses attached to it.

MAIN CAMPUS. In those institutions comprised of a main campus and one or more branch campuses, the main campus *(sometimes called the parent institution)* is usually the location of the core, primary, or most comprehensive program. Unless the institution-wide or central administrative office for such institutions is reported to be at a different location, the main campus is also the location of the central administrative office.

BRANCH CAMPUS. A campus of an institution of higher education which is organized on a relatively permanent basis *(i.e., has a relatively permanent administration)*, which offers an organized program or programs of work of at least 2 years *(as opposed to courses)*, and which is located in a community different from that in which its parent institution is located. To be considered in a community different from that of the parent institution, a branch shall be located beyond a reasonable commuting distance from the main campus of the parent institution.

INSTITUTIONAL SYSTEM. A complex of two or more institutions of higher education, each separately organized or independently complete, under the control or supervision of a single administrative body.

64

NAME OF INSTITUTION	INSTITUTION CODE NUMBER

PART A - THE BUILDING INVENTORY

Year of Construction	Line No.	Gross Square Feet (1)	Assignable Square Feet			Inaccessible Space Which the Institution Intends to Make Physically Accessible for Section 504 Compliance Purposes	
			Total (2)	Accessible (3)	Inaccessible (4)	Total Assignable Square Feet (5)	Estimated Cost of Modifications (6)
Pre-1900	1						
1900-1930	2						
1931-1950	3						
1951-1960	4						
1961-1970	5						
1971-1974	6						
1975-Present	7						
Total Sum (1-7)	8						

9	Total Cost to Implement Transition Plan $

PART B - ESTIMATED ENROLLMENT OF MOBILITY, VISUALLY, AND ACOUSTICALLY IMPAIRED STUDENTS

Number of Students		
Mobility Impaired	Visually Impaired	Acoustically Impaired
1.	2.	3.

74

75

NAME OF INSTITUTION	INSTITUTION CODE NUMBER

PART C - STUDENT CAPACITY OF INSTITUTIONALLY OWNED OR OPERATED HOUSING

Number of Beds	
1. Total	2. To Accommodate Mobility Impaired Students

PART D - ACCESSIBILITY BY ROOM USE CATEGORIES

Room Use Category	Line No	Assignable Square Feet		
		Accessible (1)	Inaccessible (2)	Inaccessible Space Which the Institution Intends to Make Physically Accessible for Section 504 Compliance Purposes (3)
110 Classroom	1			
210 Class Laboratory	2			
220 Special Class Lab	3			
230 Individual Study Lab	4			
310 Office	5			
430 Open Stack Reading	6			
440 Processing Room	7			
520 Athletic-Phys Ed	8			
525 Athletic-Phys Ed Svc	9			
540 Clinic (non-health)	10			
550 Demonstration	11			
610 Assembly	12			
620 Exhibition	13			
630 Food Facilities	14			
650 Lounge	15			
660 Merchandising Facil	16			
670 Recreation	17			
690 Locker Room	18			
880 Public Waiting	19			

INSTRUCTIONS

GENERAL

1. An inventory of physical facilities is an integral part of an institution's management system and provides useful information which influences educational decisions at state and federal levels. The primary purpose of this survey is to obtain information as to the accessibility of facilities and programs to handicapped persons, particularly persons with mobility impairments. This information will be used in an attempt to draw a reasonably accurate estimate of the degree to which people who are mobility impaired can take advantage of the educational opportunities provided by colleges and universities.

2. The Regulation promulgated by the Department of Health, Education, and Welfare pursuant to Section 504 of the Rehabilitation Act of 1973 requires that all programs of institutions receiving federal financial assistance be accessible to handicapped persons by August 2, 1977 in those areas where no structural changes are necessary. If structural changes in facilities are necessary to achieve program accessibility, such changes must be made by June 3, 1980. This does not mean that institutions can wait until that date to begin to make the changes necessary, as they must be completed as expeditiously as possible. The Regulation does not require that all facilities be made accessible although many institutions may find that some modifications of facilities will be necessary in order to achieve total program accessibility.

3. The Administration is placing emphasis on voluntary compliance as a means of complying with the requirements of Section 504. To enable HEW recipients to comply voluntarily with the Regulation issued to implement Section 504, a major goal of the Office for Civil Rights will be to collect data from this survey that can be used to determine technical assistance needs and establish technical assistance priorities. This can result in the development of projects, materials, etc., that will benefit recipients directly in those areas where technical assistance is most needed. The survey should also be of immediate benefit to participating institutions in that it will bring attention to heretofore unperceived access problems and help to identify those physical barriers which will require financial expenditures in order to be eliminated. This information may in turn serve as a basis for justifying funding requests for correcting these problems.

4. The section on technical terminology (definitions) is designed to provide a common basis for determining the accessibility of facilities in this survey. It should be clearly understood that these definitions are to apply to this survey only and do not represent the standards for compliance with the Regulation or serve any other purpose. They are meant to describe the absolute minimum criteria for purposes of this survey only which would permit reasonable access to a facility or program by most mobility impaired persons.

Where funds are expended to construct,modify, or renovate space to make it accessible, the standards of the American National Standards Institute (ANSI) or comparable standards may provide appropriate criteria. Moreover, it is essential to note that the Regulation is not restricted to mobility impaired persons but applies to everyone who is handicapped.

5. Please complete this form in duplicate and return it to the National Center for Education Statistics, ATTENTION: Facilities Survey, 400 Maryland Avenue, S. W., Washington, D. C. 20202, through designated channels.

6. The survey consists of four parts. Part A - The Building Inventory shows by age groups the total gross area, the amount of assignable area which is physically accessible, the amount of inaccessible area which will be made accessible in order to comply with Section 504, and the estimated costs of these modifications. This part also gives the total cost of implementing the institution's Transition Plan. Part B - Estimated Enrollment of Mobility, Visually, and Acoustically Impaired Students shows the estimated enrollments of these three categories of handicapped students as of the beginning of the fall 1978 term or semester. Part C - Student Capacity of Institutionally Owned or Operated Housing shows the total number of students and the number of mobility impaired students which can be accommodated by campus residences. Part D - Accessibility by Room Use Categories shows by designated room use categories the assignable square footage of accessible and inaccessible space and the amount of the inaccessible space which will be made accessible in order to comply with Section 504.

7. Detailed information required to complete this form, including technical terminology and descriptions of each item, may be found in the Higher Education Facilities Inventory and Classification Manual, 1973 (hereinafter referred to as "the manual"). If you need clarification on any item, contact your state agency or Mr. Arthur Podolsky, National Center for Education Statistics, (202) 245-8392, in Washington, D. C.

TECHNICAL TERMINOLOGY (DEFINITIONS)

The terminology defined below is intended to apply to this survey only and does not represent the standards for compliance with Section 504. (See paragraph 4 under "General.")

Mobility Impaired Person: any person who must use a standard manual or electric wheelchair or other assistive device to move from place to place, or any person who otherwise finds stairs and other similar physical features impediments to movement.

Visually Impaired Person: any person who has a visual impairment which, even with correction, necessitates some further accommodation, regardless of whether the accommodation is provided by the institution, an outside source, or the person.

Acoustically Impaired Person: any person who has a hearing impairment which, even with correction, is of sufficient severity to necessitate some accommodation--regardless of whether the accommodation is provided by the institution, an outside source, or the person--in order for him/her to process oral information. The term "acoustically impaired" applies to both deaf and hard of hearing persons.

Accessible Building: any building which has at least one regular pedestrian entrance which meets all of the following criteria. The entrance:

(1) is not obstructed by steps or other barriers that would impede the movement of mobility impaired persons,

(2) has a doorway which has a clear width clearance of at least 32 inches,

(3) does not have a threshold with an abrupt vertical rise of more than 1/2 inch, and

(4) has a door system which a mobility impaired person can operate and negotitate.

In addition, if the building has toilet facilities, it must have an accessible toilet which can be used by mobility impaired persons. If the building does not have toilet facilities within it, then a toilet which can be used by a mobility impaired person must be located conveniently nearby. If only one toilet facility is accessible, it must be available to both males and females.

Toilet Which Can Be Used By Mobility Impaired Persons: any accessible toilet facility which was originally designed, or has been subsequently remodeled, in order to make it usable by mobility impaired persons. The toilet must contain a stall wide enough to accommodate a wheelchair and be equipped with grab bars.

Accessible Room: any room which:

(1) is located within an accessible building,

(2) is located on an accessible entrance floor or on a floor which is served by an accessible level change device. An accessible level change device is any device (e.g., an elevator) which has a clear width entrance clearance of at least 32 inches; essential controls no one of which is more than 60 inches from the floor and which can be operated by a mobility impaired person; and sufficient room to permit a person in a wheelchair to enter, to operate, and to leave the level change device.

(3) can be reached through a route which is free of steps and other barriers,

(4) has a doorway with a clear width clearance of at least 32 inches and which does not have a threshold with an abrupt vertical rise of more than 1/2 inch, and

(5) has at least one accessible station. This does not obviate the responsibility of the institution to provide more than one station, if more than one station is necessary to accommodate mobility impaired persons.

Accessible Station: any station which can be used by a mobility impaired person in a manner equal or substantially similar to that of a person whose mobility is not impaired.

Station: the appropriate space, furnishings, and/or equipment to permit an individual to participate in the program to which a room is assigned, e.g., a desk in a classroom, a workbench in a laboratory, or a seat in an auditorium.

PART A - THE BUILDING INVENTORY

Include in the inventory those buildings under the jurisdiction or control of the institution's governing board, whether owned or not and whether in active use or not.

Exclude from the inventory those buildings located on remote institutional properties and/or used by relatively small portions of the student body for only a short period of time each year; investment properties; hospitals not owned by the institution, even though some limited research and instruction may be carried on in them; public schools not owned by the institution but used for practice teaching; and federal contract research centers.

For purposes of Part A, the year of construction of a building will be the year in which construction was completed or, if one or more major renovations have subsequently been made, the date of the most recent major renovation. A renovation is major if its costs exceeded 50 percent of the replacement cost of the building at the time of the renovation.

Data under the column headed "Inaccessible Space Which the Institution Intends to Make Physically Accessible for Section 504 Compliance Purposes" should represent the assignable space which, based upon its Section 504 Transition Plan, the institution plans to make physically accessible by June 3, 1980. Give an estimate (based upon the Transition Plan) of the cost to carry out the modifications necessary to make the space physically accessible according to the accessibility criteria provided in the preceding Technical Terminology section.

On line 9, give the total cost of implementing the institution's Transition Plan. The total cost of implementing the Transition Plan may also include modifications or construction not covered by column 6.

PART B - ESTIMATED ENROLLMENT OF MOBILITY, VISUALLY, AND ACOUSTICALLY IMPAIRED STUDENTS

Indicate the number of mobility, visually, and acoustically impaired students enrolled in the institution at the beginning of the 1978 fall term.

PART C - STUDENT CAPACITY OF INSTITUTIONALLY OWNED OR OPERATED HOUSING

The data provided for "Number (of beds) Able to Accommodate Mobility Impaired Students" should include only beds located in buildings and rooms which are physically accessible and from which a student has access to toilet and bath facilities which can accommodate mobility impaired persons.

This part is restricted to housing for students (as opposed to housing for faculty, visitors, etc.). It is intended to measure capacity rather than enrollment.

PART D - ACCESSIBILITY BY ROOM USE CATEGORIES

Information required to complete Part D may be found in the manual in Section 2.0: The Inventory Process and in Appendix 6.2: Standard Room Use Categories. Room use categories which tend to reflect principal program activities were selected for this survey in the interest of brevity and to reduce the workload involved in the compilation of data.

APPENDIX B

Site Visit Survey Forms

DATA SUMMARY SHEET

Name of Campus _____

Name of Person(s) Interviewed _____

_____

_____

_____

Cumulative Dates of Site Visit _____ to _____

	AS REPORTED BY THE INSTITUTION	SITE VISIT SUMMARY
1. Total Gross Square Feet (line 8-1)		
2. Total Assignable Square Feet (line 8-2)		
3. Total Accessible Assignable Square Feet (line 8-3)		
4. Total Assignable Square Feet the Institution Intends to Make Accessible (line 8-5)		
5. Total Estimated Cost of Modifications for Space the Institution Intends to Make Accessible (line 8-6)		

Provide Justification for Items Appearing on the Campus Facilities Inventory Form but *Not* on the Student Services Inventory/Evaluation Form and/or Academic Program Inventory/Evaluation Form: _____

_____

_____

_____

Is the Cost Estimate for the Total Cost to Implement a Campus Transition Plan (line 9) Realistic or Does the Cost Estimate Include Costs for Non-structural Program Modifications? _____

_____

_____

_____

Names of Audit Team Member(s) _____

_____

_____

FACILITIES INVENTORY FORM – ONE

CAMPUS _____

Existing Accessible Space that meets the definition for accessible buildings and is equal in assignable square feet to the total sum for line 8, Column 3; Part A as reported on the Building Inventory Form.

BUILDING NAME	BLDG. #	GROSS SQUARE FEET	NUMBER OF ACCESSIBLE FLOORS	ASSIGNABLE ACCESSIBLE SQUARE FEET	NOTES
Total Assignable Accessible Square Feet Equal to Line 8-3 on the Building Inventory Form Part A					

FACILITIES INVENTORY FORM – TWO

CAMPUS _____

Space the Institution Intends to make accessible based on the criteria for accessible buildings which is equal in assignable square feet to the total sum for line 8 Column 5 and the total sum for the estimated cost of modifications by building line 8, Column 6, Part A as reported on the Building Inventory Form.

BUILDING NAME	BLDG. #	GROSS SQUARE FEET	#OF CESSIBLE FLOORS	ELEV. INST. REQ.	ASSIGNABLE SQ. FT. TO BE ACCESSIBLE	ESTIMATED COST OF MODIFICATION	NOTES
Totals for Assignable Square Feet and Estimated Cost of Modification which equals Lines 8-5 and 8-6 on The Building Inventory Form Part A.							

STUDENT SERVICES INVENTORY/EVALUATION FORM

CAMPUS _____

TYPE OF STUDENT SER.	BUILDING NAME	BLDG #	A	N	NOTES
Advisement*					
Admissions*					
Alumni Activities					
Bank					
Bookstore					
Bowling Alley					
Business Office*					
Bus Service					
Campus Clubs					
Copy Machines					
Day Care Centers					
Financial Aids*					
Field House					
Food Services*					
Gift Shop					
Housing – Men's*					
Housing – Women's*					
Housing – Coed*					
Laundry					
President's Office					
Post Office*					
Registration*					
Security					
Stadium					
Student Union*					
Swimming Pool					
Theater					
Veterans' Affairs*					

ACADEMIC PROGRAM INVENTORY/EVALUATION FORM

CAMPUS _____

TYPE OF ACAD. PROGRAM	BUILDING NAME	BLDG #	A	N	NOTES
Art Studio*					
Biology Lab					
Chemistry Lab*					
Architectural Lab					
Engineering Lab					
English Classroom*					
History Lecture Hall*					
Language Lab*					
Law Library					
Math Lab					
Music Practice Room*					
Psychology Lab					
Physics Lab*					

SITE VISIT SURVEY FORM

STUDY WORKBOOK

Attention:
This evaluation guide was designed for this study only. It has not been approved for compliance purposes.

87

TABLE OF CONTENTS

PREFACE

Costs
Site

3 **EVALUATION CRITERIA**

5 **SELECTION OF THE ACCESSIBLE ENTRANCE**
- Number and Types of Entrances
- Ramping Changes of Level
- Steps in Combination with Ramps
- Wheelchair Lifts
- The Entrance Door Itself
- Building Links

15 **INTERIOR PATHS OF TRAVEL**
- Horizontal Circulation and Spaces Needed for Program Accessibility
- Vertical Circulation — The Elevator

17 **RESTROOMS**
- The Entranceway
- The Toilet Stall
- Lavatories and Restroom Accessories
- The Shower
- The Drinking Fountain

23 **SPECIAL SPACES**
- Areas of Assembly
- Sleep/Study Areas
- Libraries
- Physical Education Facilities
- Spaces for Eating
- Laboratories

PREFACE

This workbook is designed to provide information which will enable the user to investigate an existing building and determine whether a person with a mobility disability can enter and use the interior spaces required for 504 program accessibility. It must be emphasized that the criteria contained in this workbook, if followed, would not provide a barrier free environment, but will insure that those items which are essential for basic accessibility will be met. These criteria are not meant to be used for either modification of existing facilities, nor for new construction; but as shown, can be used solely to **measure** the existing building, to determine if it meets the basic needs of a mobility disabled individual. It has been found that the requirements of these people have the greatest cost impact on modifications.

In many areas, the minimum guidelines and criteria contained in this book might have a more stringent counterpart in applicable local or state regulations. If, on the campus you are investigating this is the case, these stricter regulations should be substituted on the Site Visit Survey Form. ie; some state might require that a minimum of two entrances to a building be accessible for fire regulations. This would be exceeding minimum requirements of this workbook and should be noted on the Site Visit Form.

Costs

As costs are an important part of this survey, we felt it necessary to address this subject in the preface.

Because of the detailed information required and the years of experience required for someone to make an accurate cost projection of construction work; we are not attempting to provide anything more than "ball park" estimates of the modifications needed. We feel that by making the definition of minimum accessibility criteria clearer and more uniform for the survey, we will obtain a better overview of the scope of the modifications that are realistically needed.

Where modification work normally would be undertaken by an in-plant staff, a bias has been introduced to our cost impact figure. Most other costs are weighted to obtain averages from the high and low inputs for the particular type of modification. If the cost is strictly an in-plant labor cost, (ie: removing a bench to make additional space in front of a locker) it has not been included. When it was felt that an outside contractor would be doing the work, an "overhead and profit" percentage was taken into consideration.

It would be unreasonable to expect those people undertaking this survey to be able to take into consideration each and every item in the detail required for an actual realistic estimate of the cost of modification.

If the campus has prepared an accurate, detailed cost estimate which covers the same items that are being reviewed by you; substitution, either in part or in whole should be considered as the figures that we are using are averages. Please take caution that estimates given to you, do in fact represent the same items of work that are indicated in the survey form. If these campus cost estimates fall out of the range printed on the survey form, the question of "why" should be asked of the campus. The explanation should be satisfactory to the surveyor before replacing the printed cost in the cost impact column.

Site

Although we are not reviewing or surveying the site for this campus visit, there are certain aspects of the site that we can not ignore if the building is to be considered accessible for programs offered by the college. Once the accessible building entrance is chosen, it is important to assure a person with a mobility disability can get to the facility. This path of travel has to originate from one of three places: A vehicular drop-off spot and/or parking spot and/or an accessible path of travel linking the subject building with another accessible building. As we are not reviewing these site considerations, the only responsibility that you will have will be to assure that access can be achieved by reasonable modifications to the environment. ie; You would assume that a building located at the top of a one hundred foot high hill; with only long steps leading to it; and no vehicular circulation access, would not be accessible; even if the building itself were barrier-free.

EVALUATION CRITERIA

SELECTION OF THE ACCESSIBLE ENTRANCE

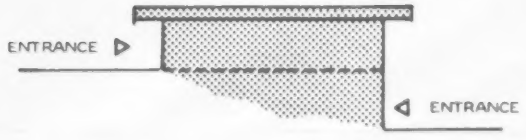
When the selection of the accessible entrance is made, several points should be taken into consideration. The entrance should either be accessible at the time of the inspection or should be the one most easily made accessible (ie: It would make sense to chose an entrance with one step rather than chosing one with six steps). In some instances, you might have to evaluate several entrances to determine the one which is the best compromise; if the one you have chosen does not provide accessibility to major parts of the building or might be on the opposite side of the building from the major exterior campus circulation routes.

Number and Types of Entrances

At least one major or primary entrance shall be provided when modifying an existing building to make it accessible to the handicapped. A major or primary entrance shall be defined as:

> *Any access point to a building, portion of a building or facility used for the purpose of entering; but does not include doors to fire stairways, other emergency exits, or doors used for servicing the building. It shall be reached by an accessible route of travel from a parking lot, public sidewalk, or vehicular drop-off point. Entrances shall not be placed where the interior path of travel would lead through hazardous or services areas such as kitchens, mechanical spaces, trash storage rooms, shops, ets.*

More than One accessible primary entrance is required if:



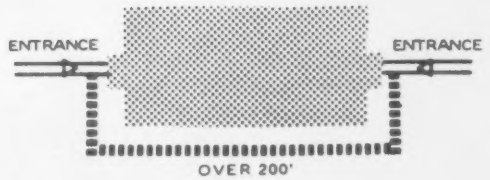
1. There are entrances at both the 1st and 2nd levels of a two story building, with topographical constraints preventing accessible pedestrian circulation around the exterior of the building; and both floors are required to meet program accessibility; and there is no elevator in the building.

NOTE: This would only be applicable if there was not any need for accessible internal circulation between these floors. ie: Classroom space and Library space within the same building would not necessarily have to have interior circulation between them; but a gym and a locker room in a physical educational facility would require an internal means of circulation as it would not be reasonable to make a student in a wheelchair use an external circulation path when it was cold or rainy; especially when they would be dressed in gym attire.

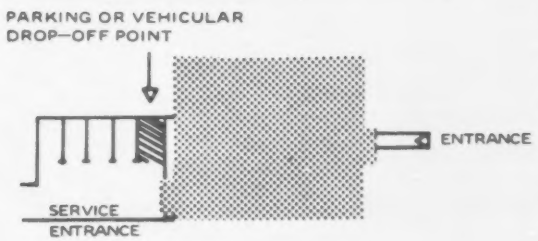
2. There are areas in the overall building structure which are required for program

accessibility, but can not be reached internally from the accessible primary entrance; and the activities which take place in these distinct and separate spaces within the building do not require accessible interior circulation.

More than one accessible entrance per building should be considered (but are not required) if:



1. The major accessible pedestrian approaches are at opposite ends of the building and the exterior circulation path is over 200'.



2. The vehicular and pedestrian paths of travel are distinct and separate. *In this case the second entrance to be made accessible might be a service entrance; if this entrance provides the closest access and care is taken so that the safety of the handicapped person is insured and the path of travel from this service entrance into the building is not through hazardous or service space, other than a service corridor.*

NOTE: A secondary entrance, such as a side or service entrance may be renovated for use by the handicapped when a entrance is provided and the building area accessible from the secondary entrance is accessible by the primary entrance. No entrance or path of travel for the handicapped will be through either hazardous or service space other than a service corridor.

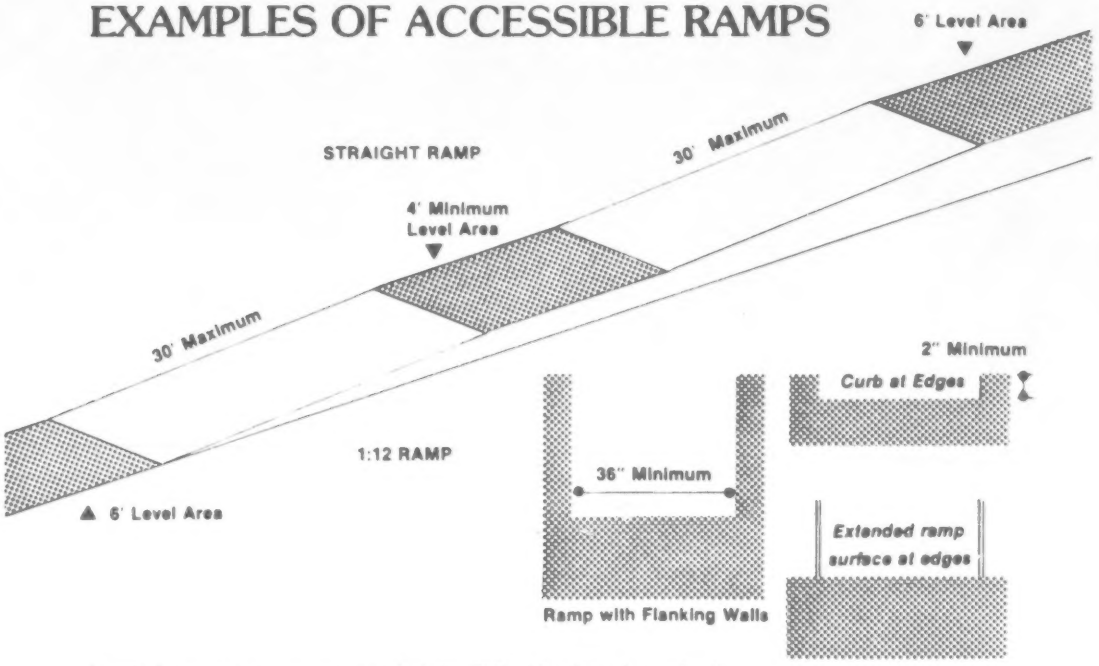
Ramping Changes of Level

Where there is an abrupt change of level such as steps, a ramp can provide access to those in a wheelchair. It is very important that anytime a ramp is used, it is designed properly, or it in itself becomes a barrier. Ramps at a minimum must meet the following standards:

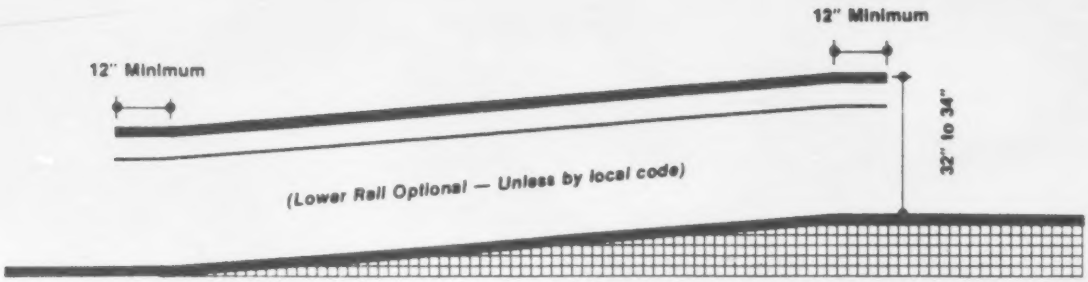
- **Minimum width of 36"**
- **Slope not to exceed 1 in 12**
- **handrails on one side 32 inches above ramp level extending 1'-0"**
- **Surface non slip (especially important in exterior use where water is more likely to be)**
- **Where a ramp meets a door (as shown in graphic)**
- **The ramp should have level areas every 30'-0" and should be level at the top and bottom for a distance of 6'-0"**
- **There shall be no abrupt changes of level greater than ½" where the ramp meets level areas**

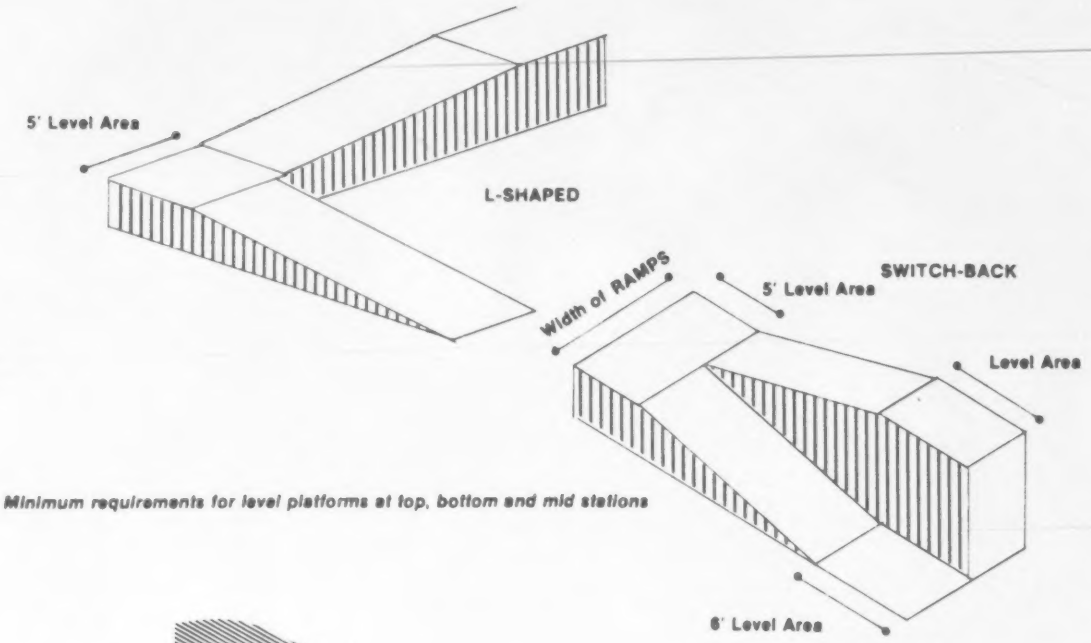
NOTE: Where there are abrupt changes of level 1" to 2", the strict requirements set forth above as to handrails and width are not applicable; but care should be taken so that there isn't any abrupt drop-off on the sides of the ramp. Any change of level greater than 1" at a door must have a level area as shown in the graphic.

EXAMPLES OF ACCESSIBLE RAMPS

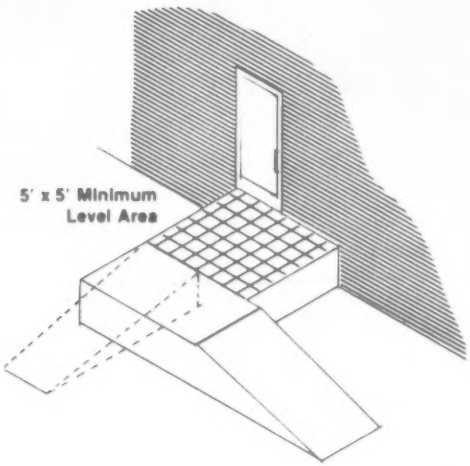


Handrails are not shown for sake of clarity, BUT at least one is required

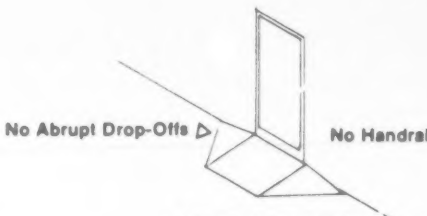




Minimum requirements for level platforms at top, bottom and mid stations



RAMP MEETING DOOR



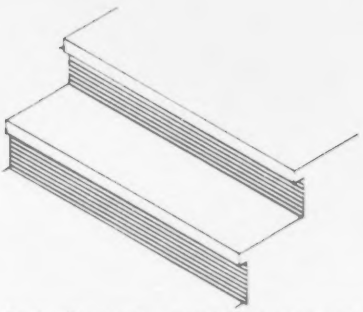
1" RAMPS

Steps in Combination with Ramps

The major problem with stairs, for those disabled individuals who can use them, is the projecting nosing. This projecting nosing can catch the foot of a person with a leg brace and cause him to trip. But, since vertical circulation using steps is impossible for those with disabilities which cause them to use wheelchairs, elevators have to be used to satisfy their need to reach upper levels of a building. In situations where an elevator is used to reach upper levels, it is not necessary to provide accessible stairs; as you are providing accessibility to both those in wheelchairs and those who can use stairs.

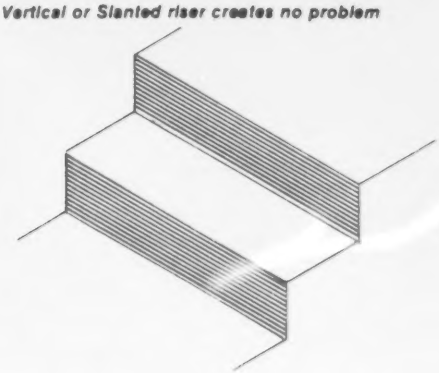
The only time that stairs should be modified (for this investigation) is when a ramp is required at the entrance that you are making accessible. In this situation, we are only providing two means of vertical circulation: The Ramp and The Stair. The ramp provides the wheelchair a means of access, but the stairs, if not designed properly, can be a barrier to some people with leg braces who can not negotiate a ramp.

- **No Projecting Nosing**
- **Handrails 32" to 34" above the stair tread**
- **Handrails extend at least 1'-0" beyond the ends of the stairs, (If they do not become a hazard themselves)**

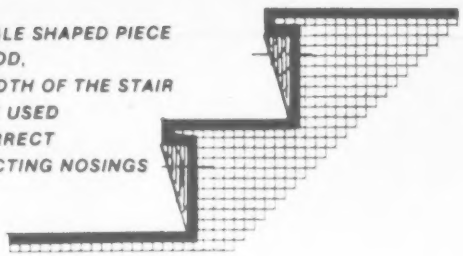


Protruding nosing may trip persons wearing leg braces

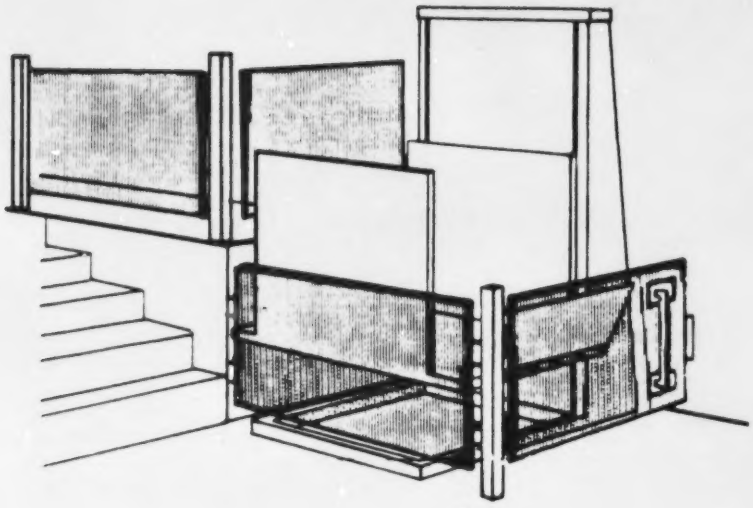
Vertical or Slanted riser creates no problem



TRIANGLE SHAPED PIECE OF WOOD, THE WIDTH OF THE STAIR CAN BE USED TO CORRECT PROJECTING NOSINGS



- WHEN RAMPS AND STAIRS APPEAR TOGETHER IN THE SAME CIRCULATION PATH, THE STAIRS SHOULD BE MODIFIED TO BE ACCESSIBLE



Wheelchair Lifts

Wheelchair lifts can be used (local or State Codes permitting) when there isn't enough space required for a ramp. It is important that they are safe and reliable. There are two types currently available.

1. One which operates similar to an elevator-straight up and down
2. One which travels up a flight of stairs

The Entrance Door Itself

All doors that are in the path of travel leading to spaced required by program accessibility must at a minimum meet the requirements listed below:

- **Minimum clear opening of 32"**
- **Have an accessible threshold which does not exceed ½" and is sloped**
- **Have an opening pressure which is not excessive (8 lbs or less)**
- **Have useable handles or pulls**
- **Have a minimum level floor area as shown**
- **If used in a vestibule, have the minimum space as shown**
- **Have a texture on handle, if the door leads to a dangerous area**

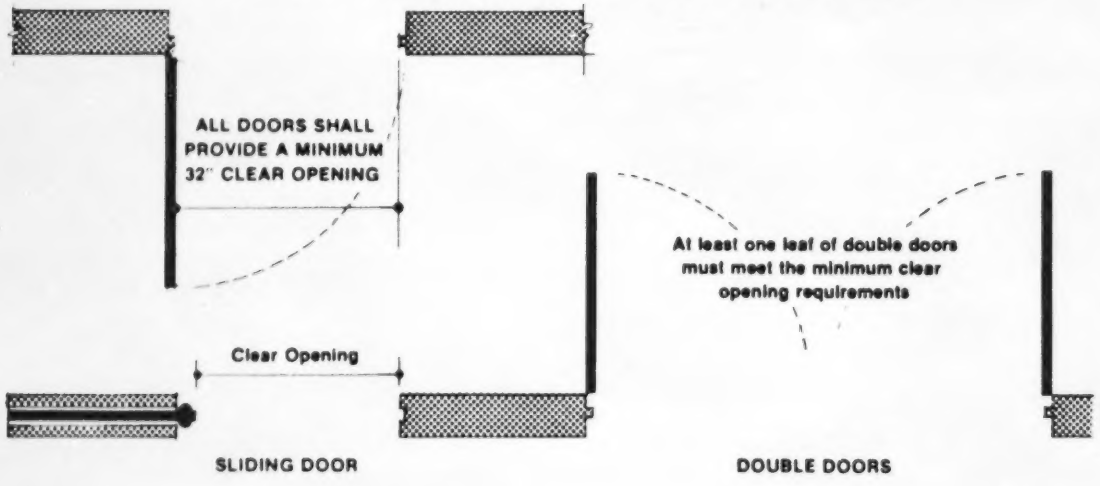
Doors with two leafs are not usable by those with disabilities unless one leaf meets the above criteria. The only situations where this should be waived would be in a lecture hall or theatre, where the doors are held in an open position during entering and exiting; or where there are magnetic fire door hold-openers which would keep the door in an open position unless there is a fire.

The 8 lbs of opening pressure is not always obtainable where wind and building pressure differentials are excessive. In situations as these, it might be required to use power assisted or power operated doors. You will have to rely on the expertise of the campus physical plant people, if recommending power operated doors.

If the 32" clear opening is not met, but the clear opening is reasonably close to 32" (ie. 30½" or greater) a *"Throw-out or Off-set Hinge"* may be used to provide the extra opening space needed to reach the 32" clear opening.

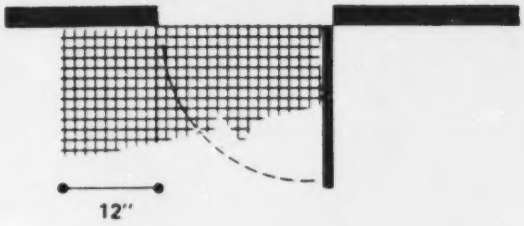
Panic hardware is usually placed well above the area necessary for measuring the clear opening, and should not be taken into consideration unless it projects well below 36" above the floor.

DOORS: MINIMUM CLEAR OPENING

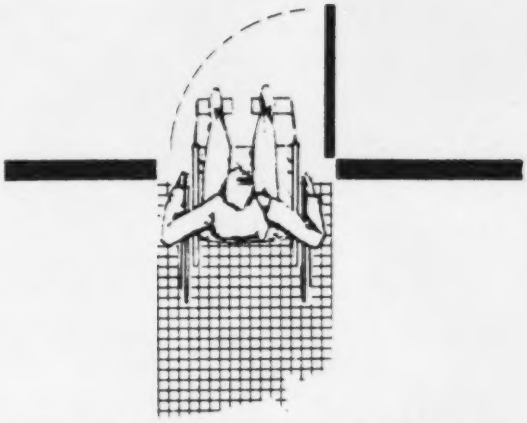

ALL DOORS SHALL PROVIDE A MINIMUM 32" CLEAR OPENING
Clear Opening
SLIDING DOOR
At least one leaf of double doors must meet the minimum clear opening requirements
DOUBLE DOORS

LEVEL AREAS ON BOTH SIDES OF DOOR

MINIMUM DIMENSION OF CORRIDOR WIDTH WITH DOOR OPENING INTO CORRIDOR



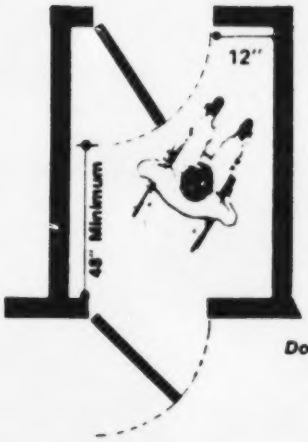
MANEUVERING SPACE ON PULL SIDE OF DOOR



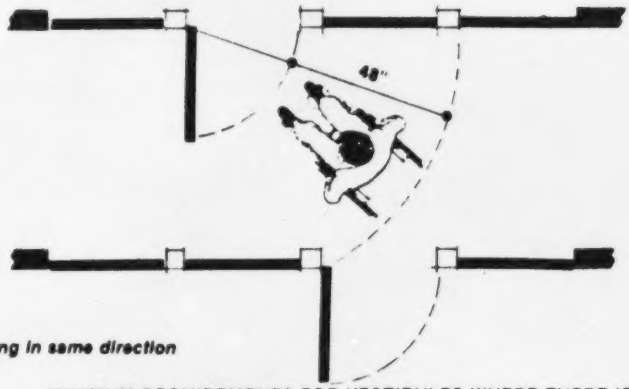
MANEUVERING SPACE ON THE PUSH SIDE OF THE DOOR

ACCESSIBLE AND USABLE VESTIBULES

MINIMUM REQUIREMENTS FOR DOORS OPENING IN SERIES

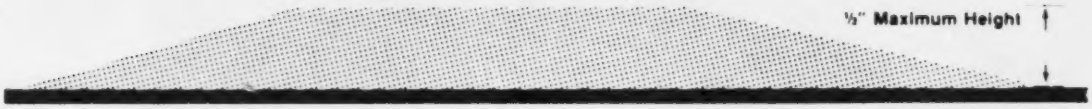


Doors must swing in same direction

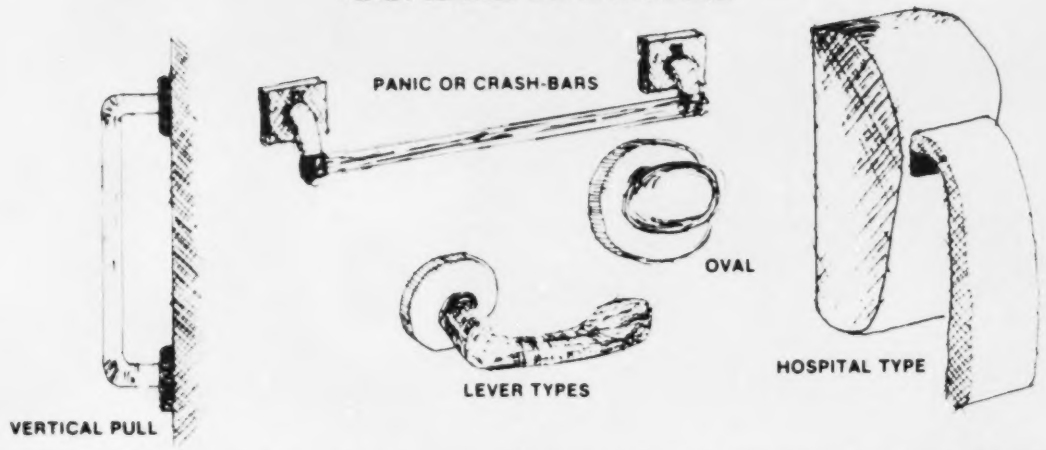


MINIMUM REQUIREMENTS FOR VESTIBULES WHERE THERE IS MORE THAN ONE DOOR

ACCESSIBLE THRESHOLDS



USABLE HANDLES



NOTE: SMALL ROUND SMOOTH KNOBS ARE NOT CONSIDERED ACCESSIBLE AND ARE NOT ALLOWED ON DOORS WHERE ACCESSIBILITY IS REQUIRED.

BUILDING LINKS

In some instances the most practical and economical solution to providing access to several buildings might be a building entrance link. As this type of design/construction project is beyond the investigative scope of our survey, its inclusion should only be considered if the campus has proposed it and has prepared a cost estimate for the project.

It should be listed under the Entrance section on the Site Survey Form and a cross reference made in the same section of each other building affected; with the cost reference only being made to one of the buildings.

INTERIOR PATHS OF TRAVEL

Horizontal Circulation and Spaces Needed for Program Accessibility

Once inside the building it is necessary to provide an accessible path of travel to any and all spaces required to meet program accessibility. This does not mean that every space in the building has to be accessible. The first step to take after the building entrance has been established, is to ascertain which floors of the building have to be accessible. Once this has been undertaken, a determination can be made to see if these floors are reachable by a mobility disabled person.

Within those areas required for program accessibility; floors, hallways, and passageways, should be barrier-free without abrupt changes of level. Those rooms and spaces needed for program accessibility connected to the hallways shall not be at a different level unless they are properly ramped or chairlifts are provided.

Floors above and below the entrance level shall be connected by ramps or elevators in order to be considered accessible. If these floors are already connected by ramps or elevators, the elevators and ramps have to meet the minimum requirements listed under the appropriate criteria section.

In situations where there are two levels in a building, with two different functions taking place at each level and each level with its own accessible entrance; then it is not necessary to have interior vertical circulation which is accessible For example: an administration/class room building has no need for interconnecting interior circulation if both floors are accessible by external entrances; but a physical education building with locker rooms on one floor and gym facilities on the other would need internal vertical connections which are accessible.

Vertical Circulation — The Elevator

Elevators will be needed in many instances for vertical circulation. In new construction or if there is a need to construct a new elevator in an existing facility; there will be many standards that should be applied. For this investigation, though, we are only concerned with the minimum elevator that will be required to provide safe and accessible transport.

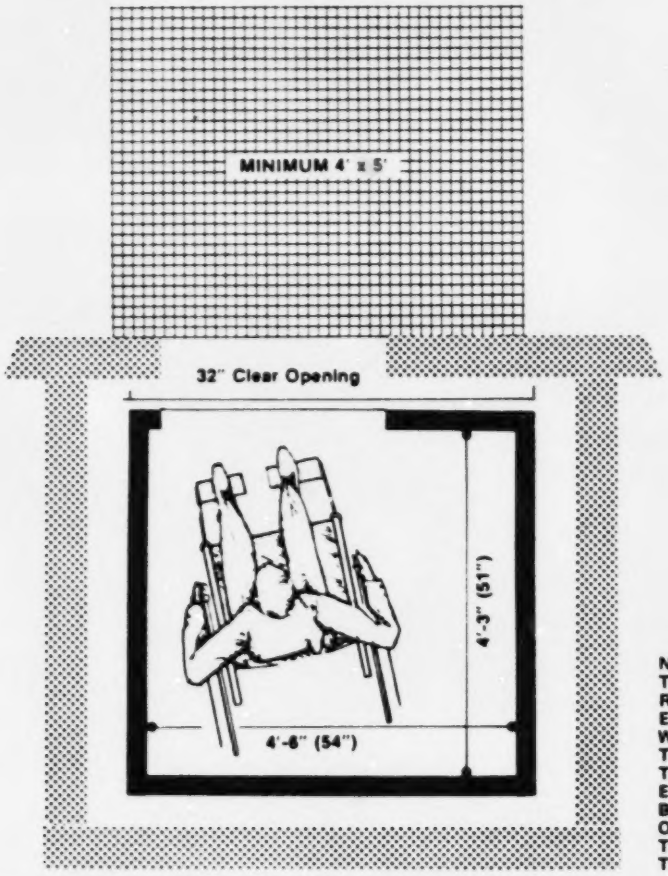
- **Size (as shown)**
- **Door shall provide a 32″ clear opening**
- **Elevator shall be accessible to entrance to building**
- **Space in front of elevator minimum 5′ wide by 4′ deep**
- **Height of controls should not exceed 48″ with the emergency stop control at bottom. Where elevator buttons can be operated with a reaching stick the 48″ height can be extended to 60″.**

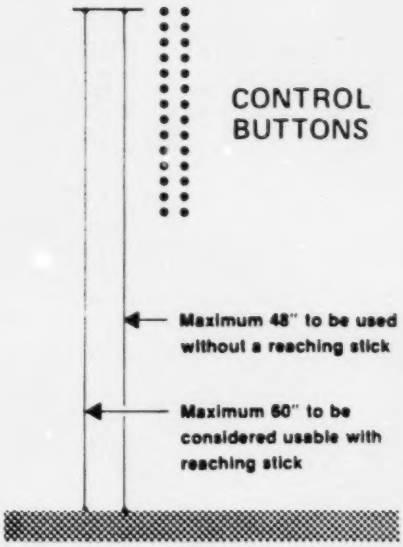
- **Door must have either a safety shoe or photo-eye or some means to stop the door from closing on a person as he or she is exiting or entering the elevator.**
- **Elevator must level within + ½"**

As a general rule of thumb, a 1500 lb. elevator will provide minimum accessibility for an existing facility.

If the campus indicates that a new elevator is required for a building that you are investigating: a justification should be obtained and recorded. Many times when asked to justify a new elevator, the campus realizes that programs can actually be transfered to other buildings or to the first floor. In other instances it would be unrealistic to move the programs to other spaces because of the expense involved. ie: specialized laboratories located on the second and third floors of a building.

MINIMUM ELEVATOR CRITERIA





NOTE: THE 4'–6" (54") DIMENSION SHOWN AS THE WIDTH OF THE ELEVATOR CAN BE REDUCED TO AS LITTLE AS 42" IN EXISTING ELEVATORS AS LONG AS A PERSON USING A WHEELCHAIR DOES NOT HAVE TO MAKE ANY TURNS IN THE ELEVATOR CAR. IN THIS CASE THE WHEELCHAIR CAN BE BACKED INTO THE ELEVATOR SO THAT THE APPROPRIATE BUTTONS CAN BE PUSHED. IF A 36" CLEAR OPENING DOOR IS PROVIDED: THE DEPTH OF THE ELEVATOR CAN BE REDUCED TO 46" IF THE WIDTH EXCEEDS THE 54" MINIMUM.

THE 4'-3" x 4'-6" (1500 lb Elevator) AND 4'-3" x 5'-8" (2000 lb. Elevator) WILL NOT ALLOW A WHEELCHAIR TO TURNAROUND, BUT WILL BE ACCEPTABLE AS A MEANS TO COMPLY WITH 504 IN EXISTING STRUCTURES.

RESTROOMS

One male and one female restroom shall be provided on the same level as the accessible entrance; or if there are no restrooms on that level, on the next closest accessible level with restrooms. If a building currently does not have restrooms for anybody, it is not necessary to provide them for the handicapped.

For a restroom to meet accessible design criteria, it must be on an accessible floor and have an accessible entrance as well as meet the basic criteria as listed under this restroom section. If you find existing curtains on the accessible stalls; they shall be acceptable if the stall is 4'-8" long by 3'-0" wide and meets all other criteria. This is not a recommended solution, as it does not provide the same degree of privacy and the curtains become an easy target for vandels; but O.C.R. will accept it as a solution because of the cost.

For this study, if a male restroom has a stall which meets the minimum criteria it is not necessary to modify a urinal also.

As toilet seat heights are to be changed in the new ANSI standards: it should not be necessary to modify seat heights that fall within 17" to 20" above the floor range.

In large buildings where a disabled person might have to travel an inordinately long distance horizontally; and if there are several male and female restrooms on each floor; then consideration should be given to making additional restrooms accessible.

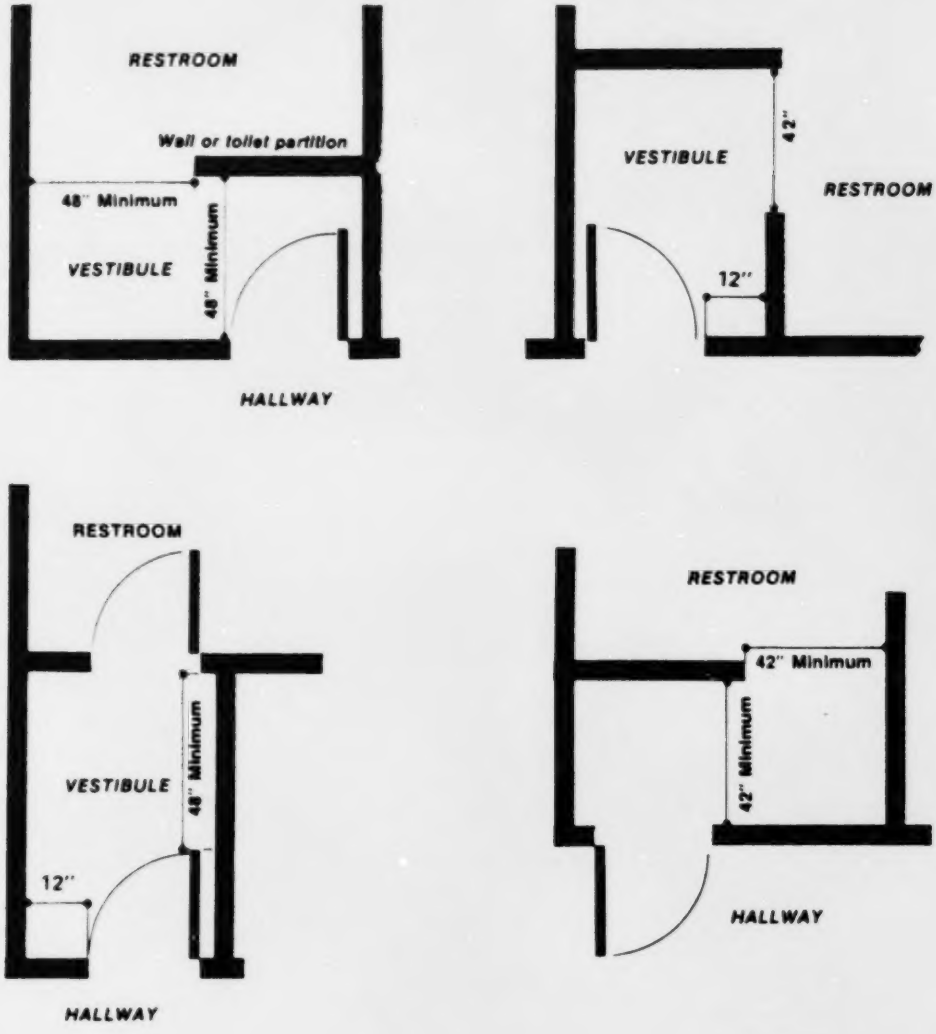
In buildings over 5 stories high, a restroom for each sex should be provided every 5th story. This is a general rule, but it should also reflect the needs of the college and the specific building. This rule of thumb is not meant to be reflective of the time that a disabled person needs to get to a restroom, but rather reflective of the number of accessible facilities needed as a minimum in a modified facility. The time deferential to take an elevator to travel one or ten floors is small.

A Unisex restroom will also be acceptable if it meets the appropriate criteria and:

1. It is acceptable by local or State code
2. It is usable by everyone, not only the disabled

The Entranceway

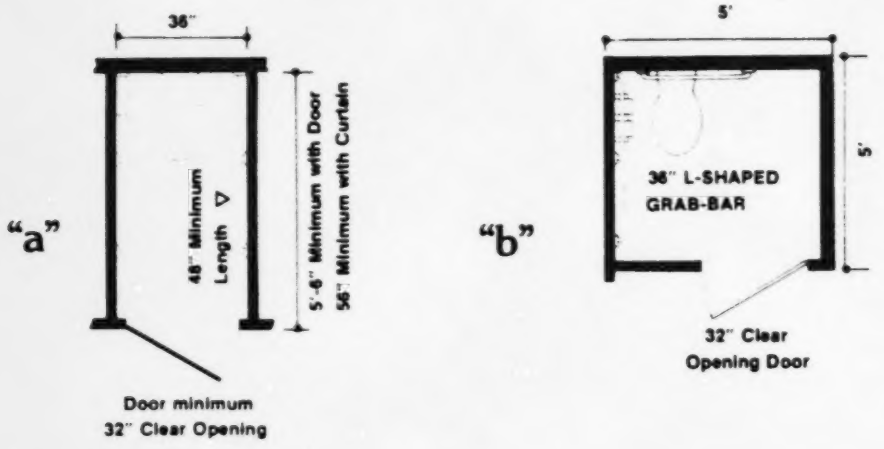
- The restroom entrance door must have at least a 32" clear opening — (see doors)
- The internal passageway must be similar to one of those shown below.
- There should be a place in the restroom where 5'-0" x 5'-0" level clear floor area exists.



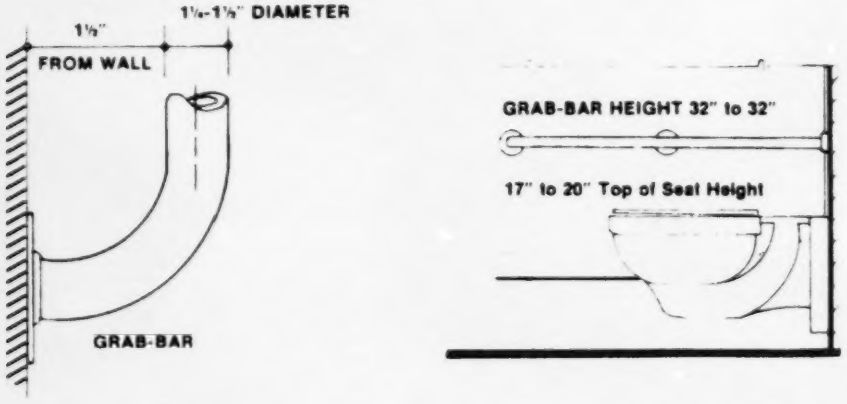
The Toilet Stall

- Stall door minimum of 32" clear opening
- Stall door: swing out (curtains in existing situations only)
- Stall size: "a" 3'-0" wide by 5'-6" long
  or "b" 5'-0" wide by 5'-0" long
- Grab bars: "a" — mounted horizontally both sides
  "b" — L-shaped horizontally grab bar
- Toilet seat: 17" to 20" above floor level

NOTE: An existing curtain is acceptable if the stall is a minimum of 4'-8" long by 3'-0" wide and meets the rest of the criteria.

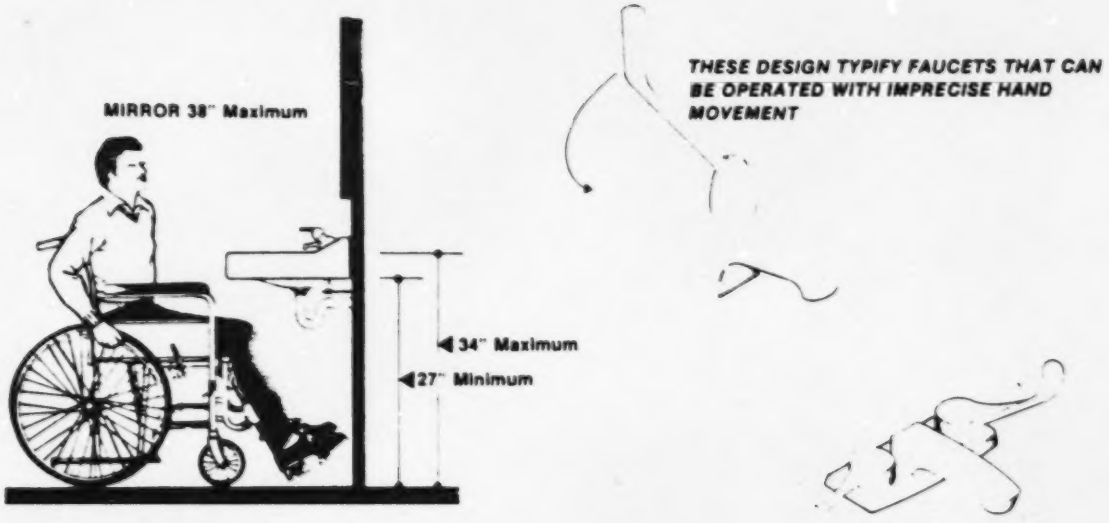


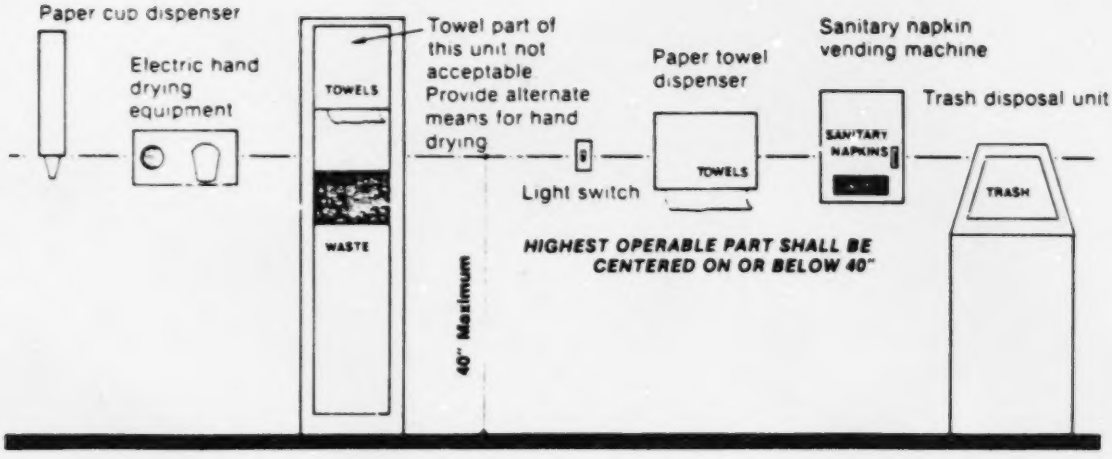
This is the only acceptable dimension



Lavatories and Restroom Accessories

- Top of Lav: 30" to 34"
- Height under apron or lavatory 27½" to 30"
- Accessible handle for faucet: (as shown)
- Towels and Dispensers 40" above the floor (as shown)
- Drain pipes protected or insulated
- Mirror mounted so that bottom is no higher than 40" above the floor

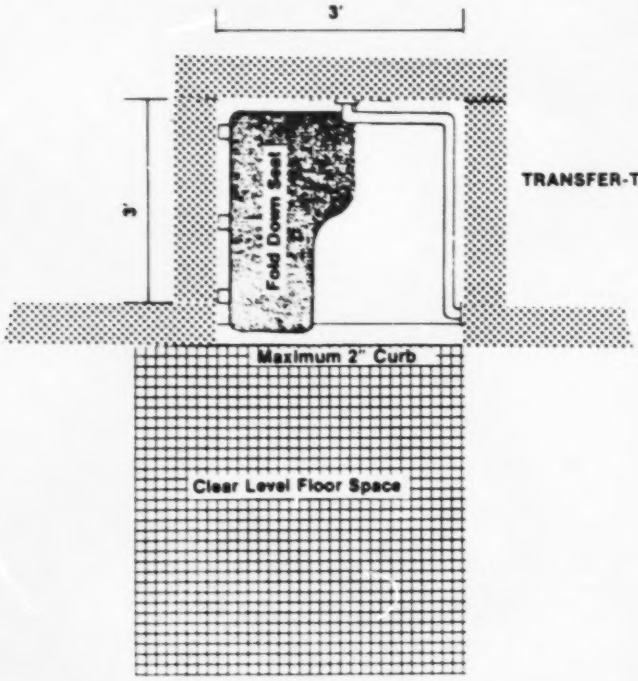




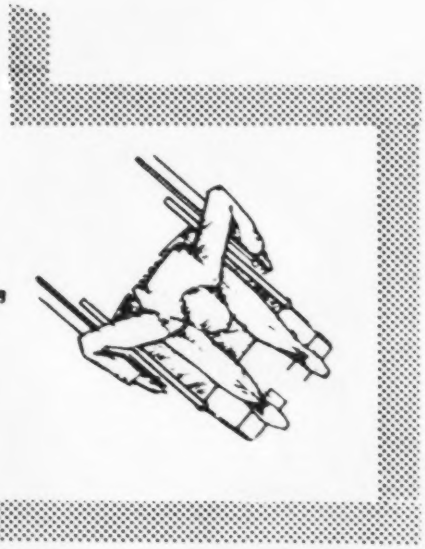
The Shower

There are two types of shower stalls that are useable by the disabled. The first is a roll-in shower. This type must not have any water retaining curb. The person using this type of shower stall takes either the wheelchair or a special shower chair into the shower. The shower stall must, in this case be large enough to contain the wheelchair. The controls should be in reach as shown and the space in front of the shower should contain ample room for maneuvering.

The second type of shower which is accessible is the 3'-0" by 3'-0" stall shower where a disabled person will transfer to a fold down or permanent seat. In this case the shower can have a water retaining curb; but this curb should be no higher than 2" so that the foot rests of the wheelchair can clear the curb when transfering to and from the seat.



TRANSFER-TYPE SHOWER



TYPICAL ROLL-IN SHOWER

The Drinking Fountain

Renel and urinary excretory systems function optimally when people are in an upright position and moving about. People in wheelchairs are deprived of this ability, and have their excretory functions adversely affected. Their kidneys excrete larger than normal amounts of minerals and salts. Therefore, it is very important that large amounts of fluids be taken throughout the day to dilute the urine and decrease the likelihood of bladder and kidney illnesses; as well as urinary track infections, which is a killer of paraplegics and quadriplegics. Waterfountains and coolers are not luxuries to disabled people.

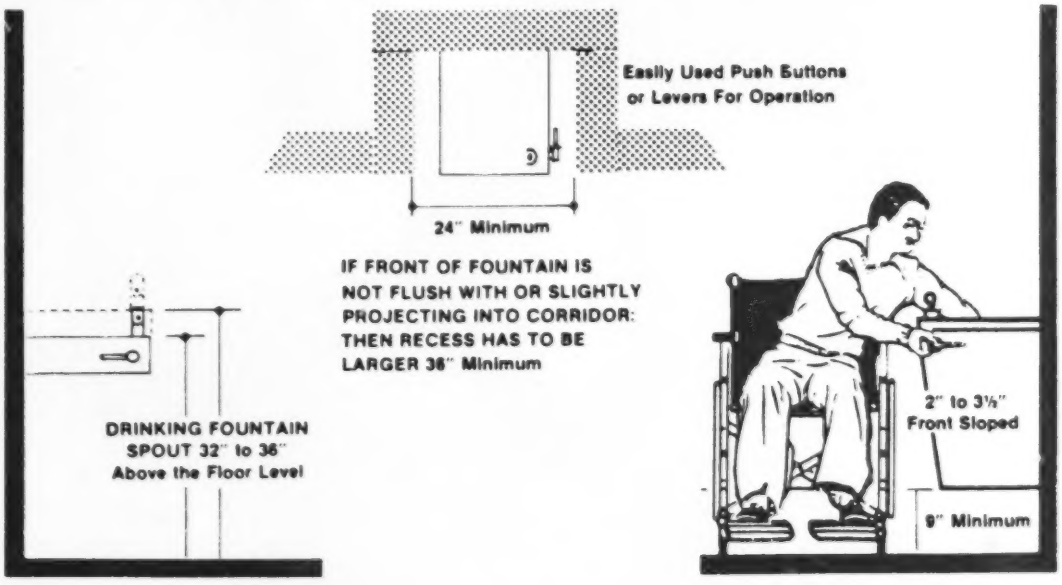
If there are existing drinking fountains: a cup dispenser can be attached for use by those who cannot use the drinking fountain. This will work only if the fountain has a level area where the cup can be placed and if the control for the fountain is easily operated. If the above cannot be met, then the drinking fountain will have to meet the following criteria to be considered accessible:

- **Height of spout above the floor: max. of 36"**
- **Controls up front (lever or easily pushed button)**
- **Spout up front**
- **Operated by hand or foot and hand**
- **If located in recess (see graphics)**

In this investigation if there are no existing drinking fountains, you do not have to provide one solely for the use of the disabled.

If the existing drinking fountain meets all but the height requirements, the campus can lower it and meet program accessibility.

The best location for an accessible drinking fountain would be near the accessible restroom. There should be at a minimum, the same number of accessible drinking fountains as there are accessible restrooms (one per male and female restroom).



SPECIAL SPACES

Although these spaces and facilities are not specifically specified in ANSI; basic criteria of movement and space needs have been applied to these specialized spaces, so that they too will be accessible to the needs of the mobility impaired. As these spaces represent a major part in the life of both students and staff they are important inclusions when making a campus programatically accessible.

Areas of Assembly

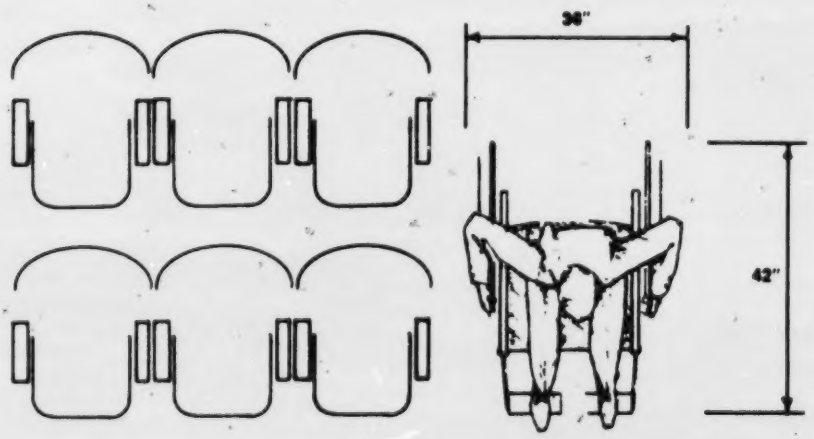
Assembly areas (Performing Arts; Spectator Areas in Physical Education Facilities; Lecture Halls; Auditoriums; etc.) should have spaces for handicapped people using wheelchairs.

Capacity of Assembly Space	Minimum Number of Seating Spaces for Wheelchairs
0-75	2 Spaces
75-300	3 Spaces
over - 300	3 + 1 for each additional 100

The above are minimum provisions. If the campus has an existing population need for a higher amount of space, then use that number when filling out the survey form.

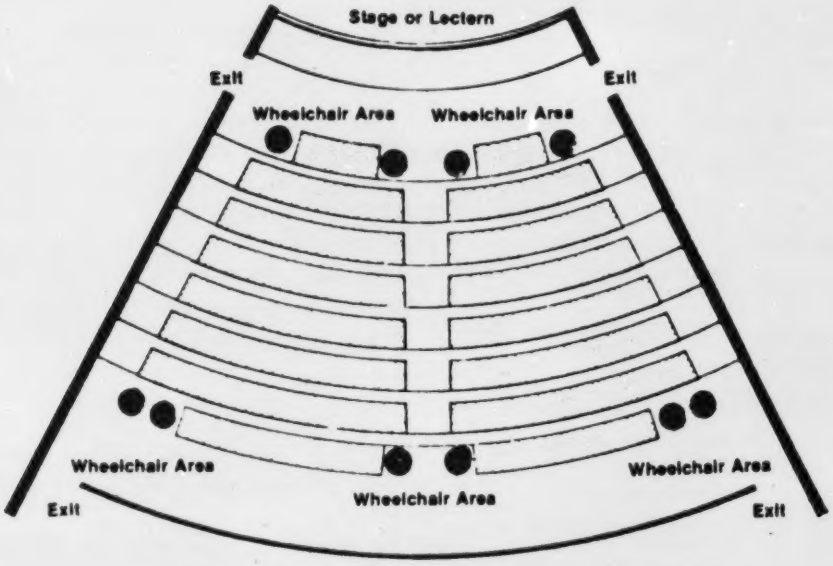
Any assembly area which is to be considered accessible should meet at a minimum the following criteria:

- **Door(s) to space must meet minimum criteria set forth under doors**
- **Seating area has to be level**
- **Space size 36" x 48"**
- **The areas set aside for wheelchairs should not block ingress and egress of others**

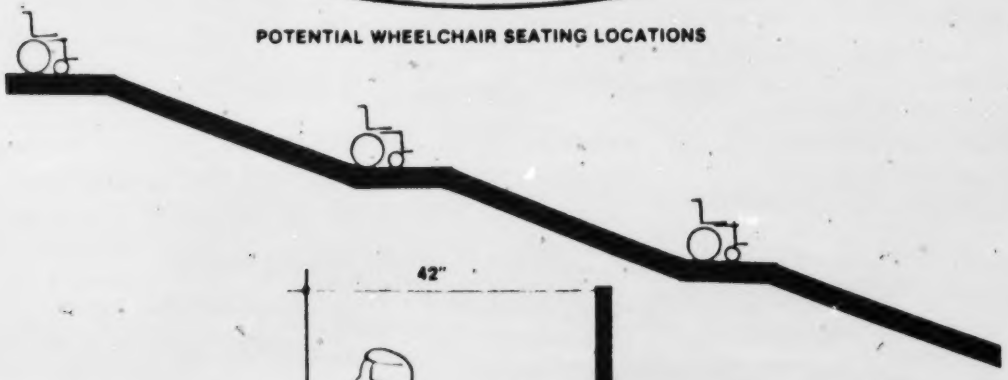


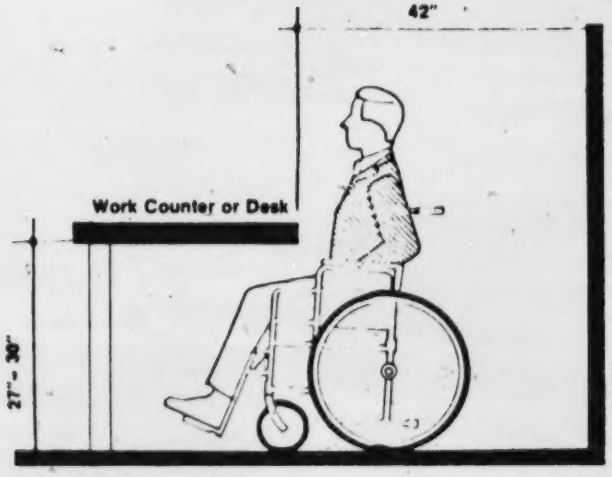
The location of positions for people in wheelchairs must be on level floor.

SEATING LOCATIONS IN AREAS OF ASSEMBLY



POTENTIAL WHEELCHAIR SEATING LOCATIONS





Sleep/Study Areas

The sleep/study area is a very important place for any student, as he or she will spend a great deal of time here. It is important that this area be especially well planned for the disabled student. Regulation 504 states that the disabled student should be afforded the same opportunities for housing that other students are given. Every dormitory room need not be accessible, but a reasonable selection of living arrangements must be available to the handicapped student. It is also important that a ghetto not be created in one dormitory, but rather that a selection of housing be made available. In considering the choice of housing, care should be taken, so that a mobility handicapped student is not assigned a room where the student would be required to travel long distances to classroom and other campus facilities or be required to regularly cross hazardous areas of vehicular traffic, railroad tracks or areas of freight delivery.

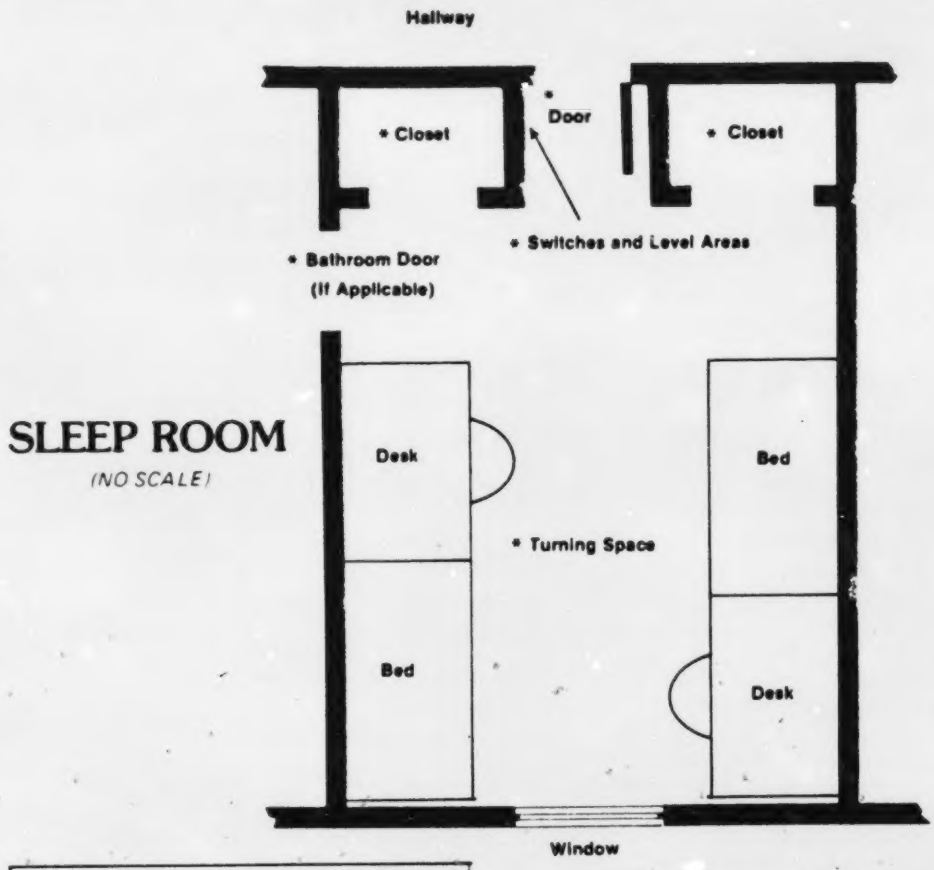
The minimum number of beds for this study, that should be made accessible is based on the following:

A – Peak need experience over the last few years ***and/or***
B – At least two bedrooms in the following types of living styles; male, female and coed

The following criteria should be followed:

- **Entrance door has at least a 32" clear opening**
- **A clear space of at least 5' x 5' somewhere in the room for maneuvering or turning**
- **The closet should be accessible**
- **An accessible restroom should be available**
- **Any doors in the room leading to bathrooms or other spaces should meet minimum criteria.**
- **Light switches and controls should be within accessible reach**

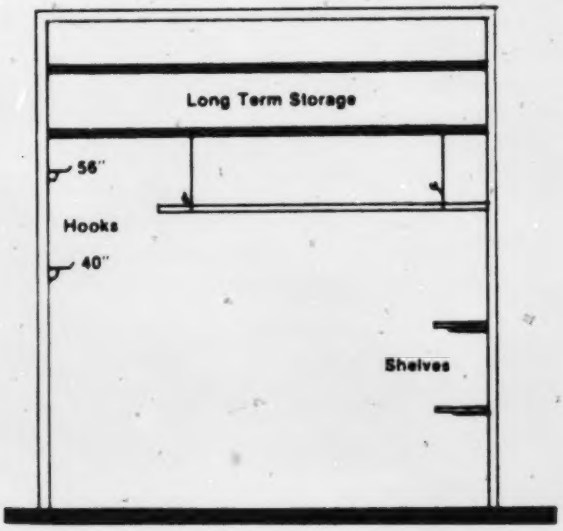
NOTE: The above minimum requirements as to the number of beds does not mean that if a campus meets this minimum it can turn away a handicapped student because there isn't an accessible bedroom. The campus would have to make additional space available.



SLEEP ROOM

(NO SCALE)

* AREAS TO BE CHECKED



CLOSET

Libraries

It would be unreasonable to assume that all books and publication resources of the library can be put within the reach of a disabled person using a wheelchair. In light of this, it is assumed that library personnel will be responsible for much of the program accessibility required in this building type. The most important criteria are as follows:

- **The entrance to the Library must not be through a turnstyle or other device which would restrict entry by a disabled person.**
- **Special resource rooms set aside for a disabled student with special equipment must be on an accessible level of the library.**

Physical Education Facilities

Physically Handicapped individuals, especially those in wheelchairs, frequently do not get adequate amounts of exercise in normal daily activities. Therefore, it is particularly important that certain physical education programs and facilities be made available. These are:

A — The Swimming pool
B — Exercise Areas
C — Gym
D — Locker Rooms and Showers

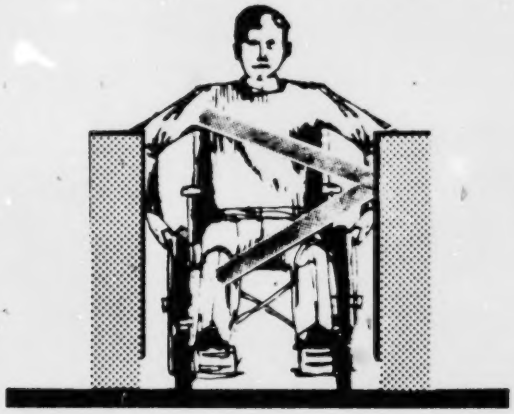
As a disabled student will be both participating and viewing activities that take place in this building, it is important that access is provided in both these areas. The criteria checklist should include:

- **Access to Pool**
- **Access to Exercise Area**
- **Restrooms (both public and locker areas including shower)**
- **Appropriate spectator seating**
- **Access to Exterior Facilities**

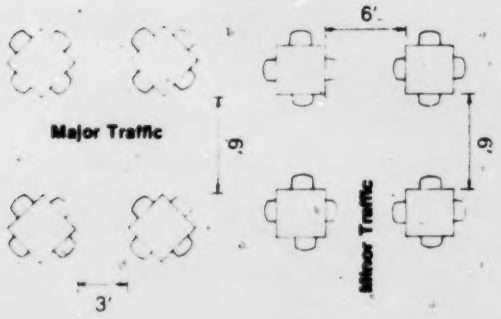
Spaces for Eating

The most important aspect is entrance to these facilities. As many colleges have controled access (turnstyle) it is important that alternate equal access is provided to the disabled student. This might mean that the turnstyle will have to be removed or the student be allowed other entrance. As the campus can provide a disabled student with waitress service, the counter does not necessarily have to be accessible. The tables should be arranged so that there is access in and out of the dining hall for the wheelchair; this is something that can be arranged easily by the campus. At least several tables should be designed (as shown) to accomodate a person seated in a wheelchair.

TURNSTYLES ARE NOT ACCESSIBLE



SEATING AREAS WHICH ARE ACCESSIBLE



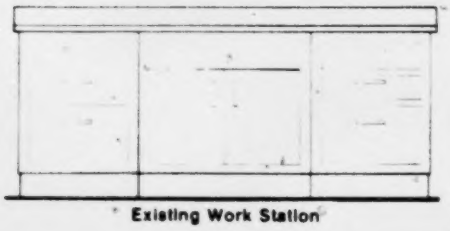
CAFETERIA SEATING

30

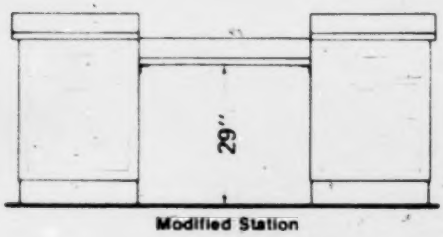
Laboratories

Because of the many ways that a campus can provide "program accessibility" to a disabled student, (eg: student partners, modifying lab stations, etc) it is important that when surveying a laboratory, concentration is placed on getting into and around the laboratory and the identifying of at least one area in the lab which has enough level floor space so that a wheelchair can be maneuvered to an existing lab station (which can be lowered and modified if necessary). The following criteria should be taken into consideration:

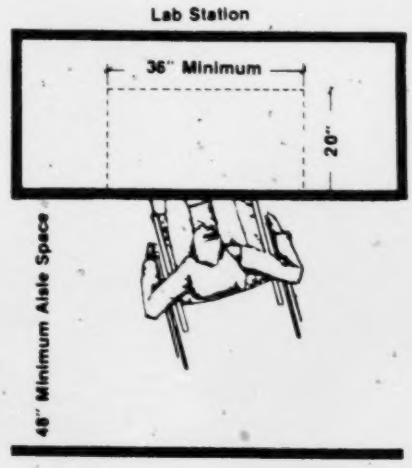
- **Laboratory is located on accessible level**
- **Any local or State codes should be considered if it effects the physical layout of the lab.**
- **Entrance Door meets minimum clear opening criteria**
- **A student in a wheelchair can get to all apparatus in the lab, although all items might not be within his or her reach**
- **There is a level area within the lab or at an existing station which could be modified to meet the requirements of a disabled student.**

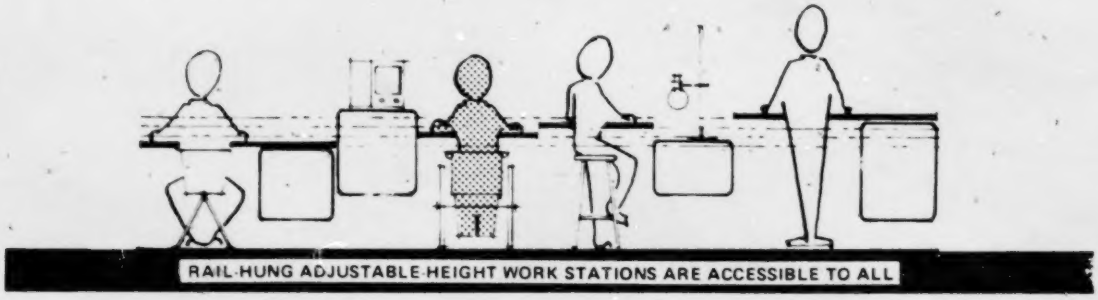


Existing Work Station



Modified Station





RAIL-HUNG ADJUSTABLE-HEIGHT WORK STATIONS ARE ACCESSIBLE TO ALL

DEPARTMENT OF HEALTH EDUCATION AND WELFARE
National Center for Educational Statistics

SITE VISIT SURVEY FORM

INVENTORY OF
COLLEGE AND UNIVERSITY PHYSICAL FACILITIES

CAMPUS _____

BUILDING _____

DATE _____ BY _____

Criteria	Existing Condition	Cost Impact	Estimate
ENTRANCE *(Entrance which is accessible or the one most easily made accessible)* **EXISTING CONDITION** **STEPS** *Number of Risers* _____ **EXISTING RAMP** *(See Below for Criteria)*	*NOTE: IF IN DOUBT ON ANY CRITERIA REFER TO WORKBOOK*		
Ramp (IF REQUIRED) ● Minimum Width (36") ● Slope (not greater than 1:12) ● Handrail (One side / 32" / extension) ● Surface (Non-slip) ● Upon meeting door (Level area 5' X 5') ● Level Areas (At Top , Bottom and every 30') ● No Abrupt Change of Level (Where ramp meets level areas)		**WOOD RAMP: $75 / LIN. FT.** **1" – 2" ENTRANCE RAMP: $100** **CONCRETE RAMPS:** 1–3 STEPS $ 1,000 4–6 STEPS $ 3,000 7+ STEPS $10,000 **OR** **$155 / LIN. FT. OF RAMP INCLUDING LEVEL AREAS WHICH ARE PART OF RAMP** *[If the area to be ramped is greater than 10 Steps - use the $155 / Lin. Ft. Cost. Multiply the number of inches vertical drop in the area to be ramped by this figure]* **HANDRAILS: $30 / LIN. FT.**	
Steps *(If in combination with Ramp)* – Non Projecting Nosing – Handrails (One side / 32" / extensions)		**NOSINGS:** TO CORRECT EXISTING: $50/RISER [6' WIDE STAIR] **HANDRAIL: $30 / LIN. FT.** **NEW STEPS: $500 PER STAIR (Max. 5 Risers)**	
Wheelchair Lifts *(If permitted by local code)*		**WHEELCHAIR LIFTS:** $3,000/INSTALLATION	
		PAGE TOTAL:	

Criteria	Existing Condition	Cost Impact	Estimate
ENTRANCE *(Entrance which is accessible or the one most easily made accessible)* EXISTING CONDITION STEPS *Number of Risers* 6 EXISTING RAMP *(See Below for Criteria)*	*NOTE: IF IN DOUBT ON ANY CRITERIA REFER TO WORKBOOK*		
Ramp (IF REQUIRED) ● Minimum Width (36") ● Slope (not greater than 1:12) ● Handrail (One side / 32" / extension) ● Surface (Non-slip) ● Upon meeting door (Level area 5' X 5') ● Level Areas (At Top, Bottom and every 30') ● No Abrupt Change of Level (Where ramp meets level areas)	THE NORTH ENTRANCE MOST EASILY MADE ACCESSIBLE	WOOD RAMP: $75 / LIN. FT. 1" – 2" ENTRANCE RAMP: $100 CONCRETE RAMPS: 1–3 STEPS $ 1,000 4–6 STEPS $ 3,000 7+ STEPS $10,000 OR $155 / LIN. FT. OF RAMP INCLUDING LEVEL AREAS WHICH ARE PART OF RAMP *[If the area to be ramped is greater than 10 Steps - use the $155 / Lin. Ft. Cost. Multiply the number of inches vertical drop in the area to be ramped by this figure]* HANDRAILS: $30 / LIN. FT.	#3,000
Steps *(If in combination with Ramp)* – Non Projecting Nosing – Handrails (One side / 32" / extensions)	STEPS AT N. ENTR. WILL BE USED WITH NEW RAMP NOSINGS TO BE CORRECTED	NOSINGS: TO CORRECT EXISTING: $50/RISER [6' WIDE STAIR] HANDRAIL: $30 / LIN. FT. NEW STEPS: $500 PER STAIR (Max. 5 Risers)	#300
Wheelchair Lifts *(If permitted by local code)*		WHEELCHAIR LIFTS: $3,000/INSTALLATION	
		PAGE TOTAL:	3,300

CAMPUS DISTRICT BUILDING "A" Pg. 1 of 7

Criteria	Existing Condition	Cost Impact	Estimate
Entrance Con't. **Entrance Door** ● Width (32" Clear Opening) ● Accessible Threshold (Less Than ½") ● Opening Pressure ● Accessible Handles ● Level Floor Area ● Vestibule (Distance between Doors) ● Power Operated (If opening pressure can not be met)		EXISTING EXTERIOR DOORS AND VESTIBULES NOT MEETING ANY OF THE REQUIREMENTS: USE $8,000 / ENTRANCE TO WIDEN AN EXISTING ENTRANCE AND PROVIDE NEW DOOR: USE $3,000 PROVIDE SWING-CLEAR HINGES ON EXTERIOR DOOR: USE $250 NEW HANDLE HARDWARE $100 / DOOR NEW THRESHOLD: $75 / DOOR NEW CLOSER: $150 / DOOR POWER OPERATOR ADDED TO EXISTING DOOR: USE $1,600 / DOOR *[If Campus climatic conditions prevent the use of a manual closer use this figure]*	
		TOTAL ENTRANCE DOOR TOTAL PREVIOUS PAGE ▷ 1 ENTRANCE TOTAL	

Criteria	Existing Condition	Cost Impact	Estimate
Entrance Con't. **Entrance Door** • Width (32" Clear Opening) • Accessible Threshold (Less Than ½") • Opening Pressure • Accessible Handles • Level Floor Area • Vestibule (Distance between Doors) • Power Operated (If opening pressure can not be met)	EXISTING DOOR OK BUT – WINDS HIGH ON CAMPUS FROM NORTH	EXISTING EXTERIOR DOORS AND VESTIBULES NOT MEETING ANY OF THE REQUIREMENTS: USE $8,000 / ENTRANCE TO WIDEN AN EXISTING ENTRANCE AND PROVIDE NEW DOOR: USE $3,000 PROVIDE SWING CLEAR HINGES ON EXTERIOR DOOR: USE $250 NEW HANDLE HARDWARE $100 / DOOR NEW THRESHOLD: $75 / DOOR NEW CLOSER: $150 / DOOR POWER OPERATOR ADDED TO EXISTING DOOR: USE $1,600 / DOOR *(If Campus climatic conditions prevent the use of a manual closer use this figure)*	#1,600
		TOTAL ENTRANCE DOOR	1,600
		TOTAL PREVIOUS PAGE	3,300
		▷ 1 ENTRANCE TOTAL	4,900

CAMPUS DISTRICT BUILDING "A" Pg. 2 of 7

Criteria	Existing Condition	Cost Impact	Estimate
RESTROOMS MEN WOMEN UNISEX *(Circle One)* FLOOR			
● Entranceway (Door 32" Clear Opening)		WIDENING EXISTING DOOR: USE $500 / DOOR	
● Internal Passageway (Meets criteria)		TO ENLARGE PASSAGEWAY: USE $1,000 / PASSAGEWAY	
● Toilet Stall (One stall per restroom) Door 32" Clear opening / Swing out Size (a or b) Grab Bars (Horizontal) Toilet Seat (17" to 20")		TO CORRECT DOOR & PARTITION USE: $300 / STALL TO CORRECT DOOR WIDTH ONLY: USE: $150 / STALL SEAT RISER: USE $60 / TOILET NEW GRAB BARS: $125 / STALL NEW TOILET: $750 / TOILET REMOVE DOOR – REPLACE WITH CURTAINS: $50 / STALL *(CAMPUS OPTION)*	
● Lavatory (One per restroom) 27⅛" to 30" under apron Top of Lavatory 30" to 34" Accessible Faucet Drain Pipes Covered		REPLACE FAUCET AND PROVIDE DRAIN PROTECTION: $100 / LAVATORY TO ADJUST HEIGHT OF EXISTING LAVATORY: $200 / LAVATORY NEW LAVATORY: USE $750 / LAV	
● Accessories (Within reach per criteria) Towels and Dispensers Mirror		IF ACCESSORIES HAVE TO BE LOWERED: USE $200 / REST ROOM PROVIDE NEW MIRROR: $75 / MIRROR	
Shower ● Shower *(If applicable)* Roll-in Transfer Type		MODIFY CURB: USE $300 NEW SHOWER: USE $ 2,000	
		2 TOTAL RESTROOM: *(INCLUDING DRINKING FOUNTAINS)*	

Criteria	Existing Condition	Cost Impact	Estimate
RESTROOMS (MEN) WOMEN UNISEX *(Circle One)* FLOOR 1ST			
• Entranceway (Door 32" Clear Opening)		WIDENING EXISTING DOOR: USE $500 / DOOR	
• Internal Passageway (Meets criteria)		TO ENLARGE PASSAGEWAY: USE $1,000 / PASSAGEWAY	
• Toilet Stall (One stall per restroom)	PARTITION ONLY	TO CORRECT DOOR & PARTITION USE: $300 / STALL	$300
Door 32" Clear opening / Swing out	30" DOOR	TO CORRECT DOOR WIDTH ONLY: USE: $150 / STALL	
Size (a or b)	24"	SEAT RISER: USE $60 / TOILET	
Grab Bars (Horizontal)	NEEDS GRAB BAR	NEW GRAB BARS: $125 / STALL	$125
Toilet Seat (17" to 20")		NEW TOILET: $750 / TOILET	
		REMOVE DOOR – REPLACE WITH CURTAINS: $50 / STALL *(CAMPUS OPTION)*	
• Lavatory (One per restroom)	LAV OK	REPLACE FAUCET AND PROVIDE DRAIN PROTECTION: $100 / LAVATORY	
27⅛" to 30" under apron		TO ADJUST HEIGHT OF EXISTING LAVATORY: $200 / LAVATORY	
Top of Lavatory 30" to 34"		NEW LAVATORY: USE $750 / LAV	
Accessible Faucet			
Drain Pipes Covered			
• Accessories (Within reach per criteria)	MIRRORS TOO HIGH	IF ACCESSORIES HAVE TO BE LOWERED: USE $200 / REST ROOM	$75
Towels and Dispensers		PROVIDE NEW MIRROR: $75 / MIRROR	
Mirror			
Shower			
• Shower *(If applicable)*		MODIFY CURB: USE $300	
Roll-in		NEW SHOWER: USE $ 2,000	
Transfer Type			
		2 TOTAL RESTROOM: *(INCLUDING DRINKING FOUNTAINS)*	500 25 $525

CAMPUS DISTRICT BUILDING "A" Pg. 3 of 7

Criteria	Existing Condition	Cost Impact	Estimate
Drinking Fountains			
DRINKING FOUNTAINS ● Height of Spout ● Controls up front ● Spout up front ● Operated by hand or hand and foot ● Recessed Area (See Criteria)		TO LOWER EXISTING FOUNTAIN: USE $200 / FOUNTAIN INSTALL NEW DRINKING FOUNTAIN USE: $1,000 / FOUNTAIN PROVIDE CUP DISPENSER: $25 / DISPENSER	

CAMPUS BUILDING Pg. ___ of ___

Criteria	Existing Condition	Cost Impact	Estimate
Drinking Fountains DRINKING FOUNTAINS ● Height of Spout ● Controls up front ● Spout up front ● Operated by hand or hand and foot ● Recessed Area (See Criteria)			
	EXISTING 1ST FL. FOUNTAIN HAS LEVEL SPOT FOR CUP	TO LOWER EXISTING FOUNTAIN: USE $200 / FOUNTAIN INSTALL NEW DRINKING FOUNTAIN USE: $1,000 / FOUNTAIN PROVIDE CUP DISPENSER: $25 / DISPENSER	#25

CAMPUS DISTRICT BUILDING A Pg. 4 of 2

(ALL FLOORS SHOULD BE IDENTIFIED AS FOLLOWS: 00 SUB BASEMENT / 0B BASEMENT / 01 FIRST FLOOR 02 SECOND FLOOR / 03 THIRD FLOOR / ETC.)

INTERIOR CIRCULATION

HORIZONTAL *(Hallways, Passageways and Floors)*

Are all the floors level through out ? If not list those *(required for program accessibility)* which require ramps or wheelchair lifts to make them level. *[See appropriate criteria for cost]*

FLOOR	RECOMMENDATION	COST IMPACT	ESTIMATE
		Total: Horizontal Circulation	

DOORS LEADING INTO SPACES REQUIRED FOR PROGRAM ACCESSIBILITY

Interior doors leading to spaces which are needed for program accessibility must meet the following criteria:

• Width (32" Clear Opening) • Accessible Threshold (½" or less) • Opening Pressure • Accessible Handle (Per Criteria) • Level Floor Area (Per Criteria) • Vestibule (Distance between Doors)	**NEW ACCESSIBLE DOOR: REPLACE EXISTING DOOR USE: $600 / DOOR** **ADD LEVER HARDWARE: $80 / DOOR** **REMOVE AND REPLACE EXISTING THRESHOLD: $50 / DOOR** **PROVIDE SWING CLEAR HINGE: $150 / DOOR**

List the Room Number of Doors not meeting the above criteria

New Doors Required *Doors for Swing Clear Hinge* *Accessible Threshold* *Misc.*

Total: Interior Doors

PAGE TOTAL

(ALL FLOORS SHOULD BE IDENTIFIED AS FOLLOWS 00 SUB BASEMENT / 0B BASEMENT / 01 FIRST FLOOR
02 SECOND FLOOR / 03 THIRD FLOOR / ETC)

INTERIOR CIRCULATION

HORIZONTAL *(Hallways, Passageways and Floors)*

Are all the floors level through out ? If not list those *(required for program accessibility)* which require ramps or wheelchair-lifts to make them level. *[See appropriate criteria for cost]*

FLOOR	RECOMMENDATION	COST IMPACT	ESTIMATE
01	2 LEVELS – ENTER AT LOWER – 9 STEPS TO UPPER RECOMMEND EITHER RAMP OR CHAIRLIFT	WHEELCHAIR LIFT $ 3,000	$ 3,000
		Total: Horizontal Circulation	3,000

DOORS LEADING INTO SPACES REQUIRED FOR PROGRAM ACCESSIBILITY

Interior doors leading to spaces which are needed for program accessibility must meet the following criteria:

- 'Width (32" Clear Opening)
- Accessible Threshold (½" or less)
- Opening Pressure
- Accessible Handle (Per Criteria)
- Level Floor Area (Per Criteria)
- Vestibule (Distance between Doors)

NEW ACCESSIBLE DOOR: REPLACE EXISTING DOOR USE: $600 / DOOR x 6	$ 3,600
ADD LEVER HARDWARE: $80 / DOOR	
REMOVE AND REPLACE EXISTING THRESHOLD: $50 / DOOR x 2	100
PROVIDE SWING CLEAR HINGE: $150 / DOOR x 2	300

List the Room Number of Doors not meeting the above criteria

New Doors Required	*Doors for Swing Clear Hinge*	*Accessible Threshold*	*Misc.*
RM 102 202	111	122	
104 209	116	222	
106 206			
6 DOORS	2 DOORS	2 DOORS	

Total: Interior Doors $ 4,000 +

PAGE TOTAL $ 7,000

RAMPOS DISTRICT BUILDING "A" Pg. 5 of 7

Criteria	Existing Condition	Cost Impact	Estimate
Interior Circulation Con't. **Elevators**			

ELEVATOR JUSTIFICATION:

In this building; are there any non-accessible floors which will have to be made accessible so that the institution can meet 504? If so, describe the special needs and justify them if an elevator will be required to meet this multi-level access.

NEED FOR NEW ELEVATOR

JUSTIFICATION		**NEW ELEVATORS:** **2 STOP ELEVATORS: $40,000** **HIGH RISE: $25,000/FLOOR SERVED**	
ELEVATOR *(Existing)* ● Existing Use (Pass./Freight) ● Floors Served (OB,01,02,03,04 etc.) ● Size (See Criteria) ● Door Size (Minimum 32" Clear Opening) ● May be entered on floor level of accessible entrance ● Space in front of elevator (See Criteria) ● Button Height Range ● Emergency Control Location ● Door Safety (See Criteria) ● Leveling (See Criteria)		**MOVE PANELS: $1,000/CAR** **MOVE CALL BUTTONS: $175/BUTTON** **INSTALL SAFETY SHOE: $500/CAR** **PHOTO EYES: $1,500/CAR** **NEW CAB IN EXISTING SHAFT: USE $15,000**	
		▷3 **INTERIOR CIRCULATION TOTAL:**	

Criteria	Existing Condition	Cost Impact	Estimate
Interior Circulation Con't. **Elevators**			

ELEVATOR JUSTIFICATION:

In this building; are there any non-accessible floors which will have to be made accessible so that the institution can meet 504? If so, describe the special needs and justify them if an elevator will be required to meet this multi-level access.

NEED FOR NEW ELEVATOR

No ELEVATOR
3 STOP ELEVATOR NEEDED

JUSTIFICATION

SPECIALIZED LABS ON 2 & 3 FLOORS COST TO MOVE LABS MORE THAN ELEVATOR

NEW ELEVATORS:
2 STOP ELEVATORS: ~~$40,000~~
HIGH RISE: $25,000/FLOOR SERVED
×3

$ 75,000

ELEVATOR *(Existing)*

- Existing Use (Pass./Freight)
- Floors Served (OB,01,02,03,04 etc.)
- Size (See Criteria)
- Door Size (Minimum 32" Clear Opening)
- May be entered on floor level of accessible entrance
- Space in front of elevator (See Criteria)
- Button Height Range
- Emergency Control Location
- Door Safety (See Criteria)
- Leveling (See Criteria)

OR IF EXISTING

EXISTING ELEVATOR HAS BUTTONS ABOVE 5' (60") MAX RANGE AND DOES NOT HAVE SAFETY DEVICE TO PREVENT CLOSING OF DOOR ON PASSENGER

MOVE PANELS: $1,000/CAR → 1,000
MOVE CALL BUTTON: $175/BUTTON ×3 → 525
INSTALL SAFETY SHOE: $500/CAR → 500

PHOTO EYES: $1,500/CAR

NEW CAB IN EXISTING SHAFT:
USE $15,000

	FROM PG 5 → +	2,025 7,000
	D3 INTERIOR CIRCULATION TOTAL:	$ 9,025

CAMPUS DISTRICT BUILDING "A" Pg. 6 of 7

Criteria	Existing Condition	Cost Impact	Estimate
SPECIAL SPACES			
AREAS OF ASSEMBLY		REMOVE SEAT AND PROVIDE LEVEL AREA IN STEPPED PORTION OF ASSEMBLY SPACE USE: $500 / SEAT	
SLEEP/STUDY AREA		TO MODIFY EXISTING DORM ROOM FROM STANDARD INCL. DOORS, SWITCHES, AND CLOSETS USE $2,300	
LIBRARY / EATING SPACE / ETC.		REMOVAL OF TURNSTYLE AND REPLACEMENT WITH ELECTRONIC DETECTION DEVICE USE $1,500	
PHYSICAL EDUCATION		POOL LIFT INSTALLED: USE $700	
LABORATORIES		MODIFY EXISTING STATION USE $200 / L.F. OF COUNTER PROVIDE NEW STATION USE $1,500 PROVIDE NEW MOBILE LAB STATION USE $500 ▷ 4 TOTAL	

Criteria	Existing Condition	Cost Impact	Estimate
SPECIAL SPACES			
AREAS OF ASSEMBLY		REMOVE SEAT AND PROVIDE LEVEL AREA IN STEPPED PORTION OF ASSEMBLY SPACE USE: $500 / SEAT	
SLEEP/STUDY AREA		TO MODIFY EXISTING DORM ROOM FROM STANDARD INCL. DOORS, SWITCHES, AND CLOSETS USE $2,300	
LIBRARY / EATING SPACE / ETC.		REMOVAL OF TURNSTYLE AND REPLACEMENT WITH ELECTRONIC DETECTION DEVICE USE $1,500	
PHYSICAL EDUCATION	POOL LIFT REQUIRED	POOL LIFT INSTALLED: USE $700	#700
LABORATORIES		MODIFY EXISTING STATION USE $200 / L.F. OF COUNTER PROVIDE NEW STATION USE $1,500 PROVIDE NEW MOBILE LAB STATION USE $500 ▷ 4 TOTAL	

CAMPUS DISTRICT BUILDING "A" Pg 7 of 7

CAMPUS TABULATION SHEET

Campus _____ Date of Survey _____ By _____

BUILDING	1 ENTRANCE	2 REST ROOMS	3 INTERIOR CIRCULATION	4 SPECIAL SPACES	BUILDING TOTAL

CAMPUS TOTAL _____

CAMPUS TABULATION SHEET

Campus DISTRICT COLLEGE Date of Survey 2/79 By COTLER

BUILDING	1 ENTRANCE	2 REST ROOMS	3 INTERIOR CIRCULATION	4 SPECIAL SPACES	BUILDING TOTAL
BUILDING "A"	$4,900	$ 525	$ 9,025	$ 700	$15,150

123

134

CAMPUS TOTAL 135

Appendix

DEFINITIONS OF BUILDING AREAS

1. GROSS AREA: 8/

A. Definition: The sum of the floor areas of the building included within the outside faces of exterior walls for all stories, or areas that have floor surfaces.

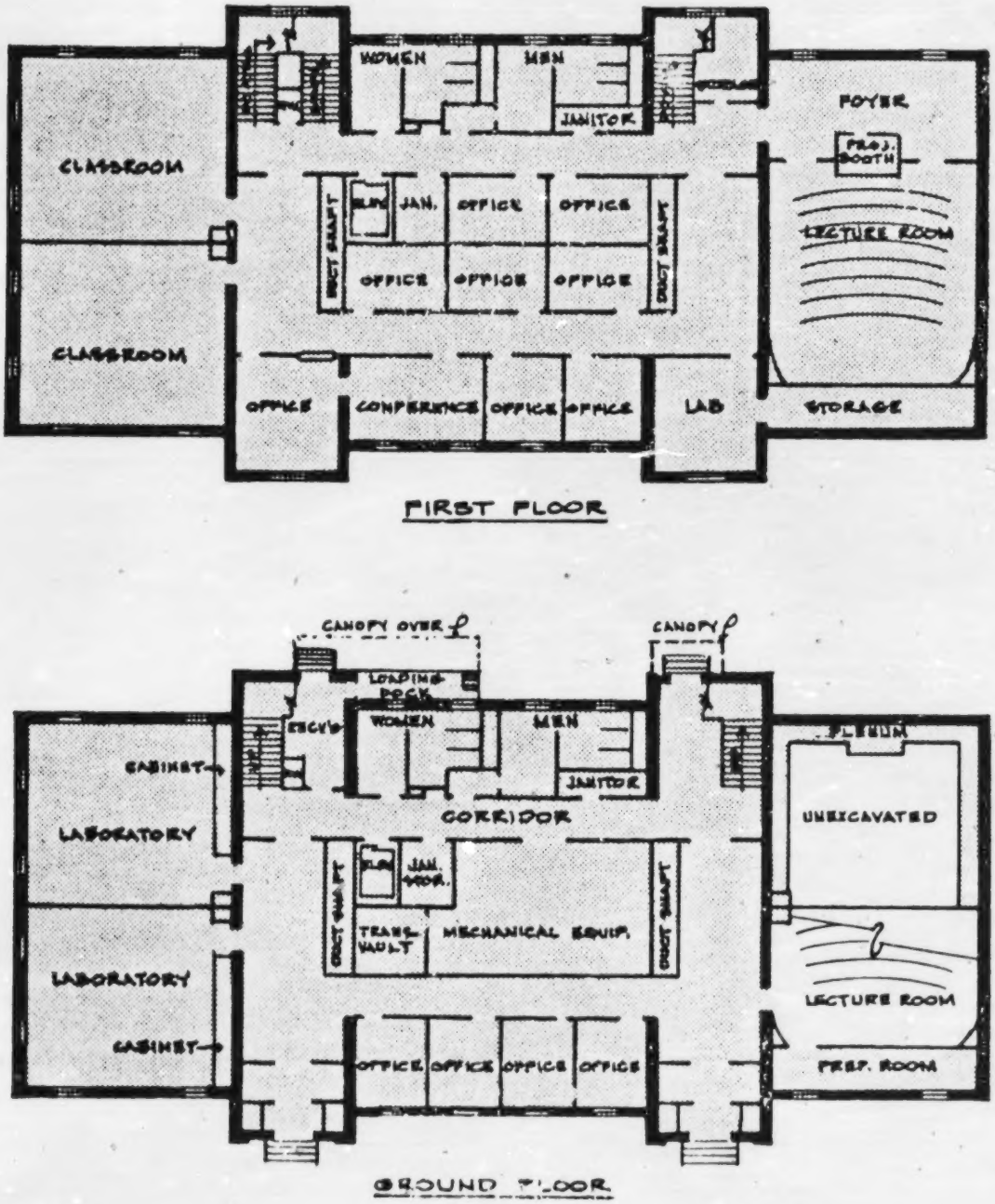
B. Basis for Measurement: Gross area should be computed by measuring from the outside face of exterior walls, disregarding cornices, pilasters, buttresses, etc., which extend beyond the wall face. Measured in terms of gross square feet (GSF).

C. Description: In addition to all the internal floored spaces obviously covered above, gross area should include basements (except unexcavated portions), attics, garages, enclosed porches, penthouses, mechanical-equipment floors, lobbies, mezzanines, all balconies (inside or outside) utilized for operational functions, and corridors, provided they are within the outside face lines of the building. Roofed loading or shipping platforms should be included, whether within or outside the exterior face lines of the building. Stairways, elevator shafts, mechanical-service shafts, and ducts are to be counted as gross area on each floor through which the shaft passes.

D. Limitations: Exclude open courts and light wells, or portions of upper floors eliminated by rooms or lobbies that rise above single-floor ceiling height.

8/ Source: Federal Construction Council Technical Report No. 50 (Publ. 1235), Classification of Building Areas, National Academy of Sciences, Building Research Advisory Board.

Figure 11. Gross area



2. ASSIGNABLE AREA:

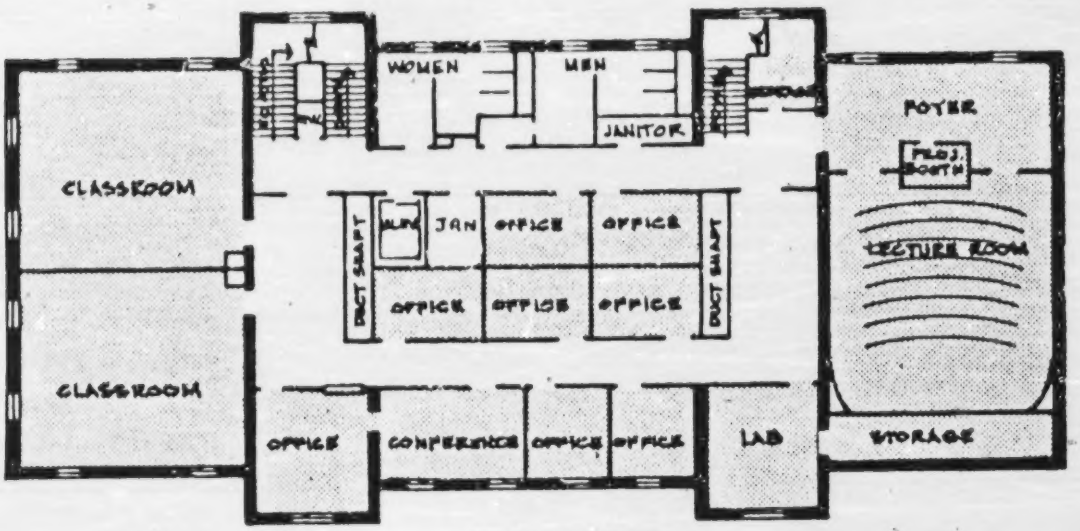
A. Definition: The sum of all areas on all floors of a building assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant (excepting those spaces defined in appendix 6.5 as custodial, circulation, mechanical, and structural areas).

B. Basis for Measurement: All assignable areas should be computed by measuring from the inside finishes of surfaces which form the boundaries of the designated areas. Do not include unusable areas having less than 6'6" clear head room.

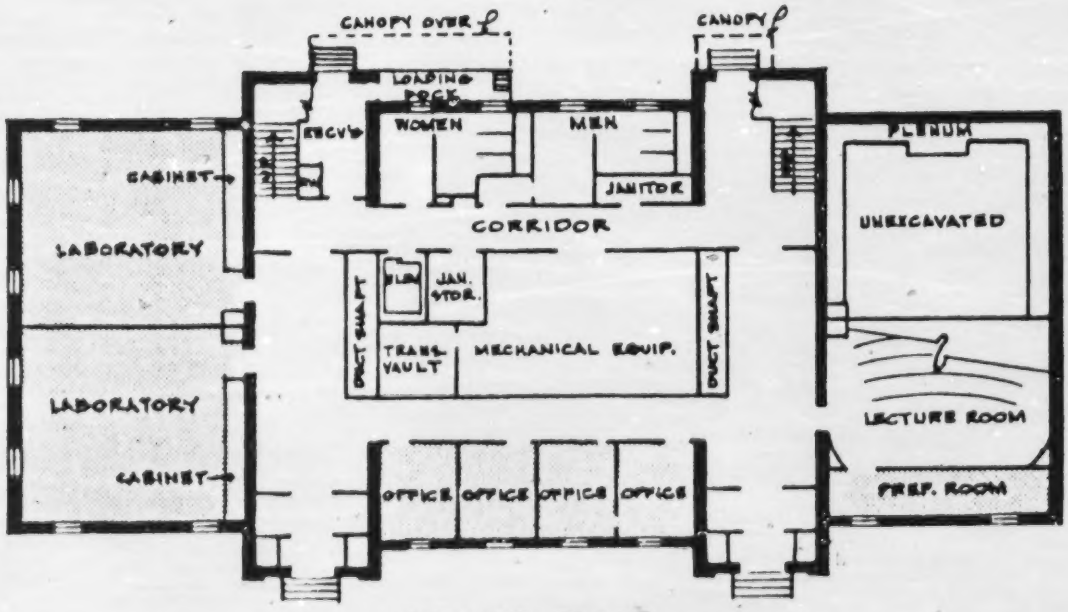
C. Description: Included should be space subdivisions for offices, classrooms, laboratories, seminar and conference rooms, libraries, file rooms, storage rooms, etc., including those for special purposes (e.g., auditoriums, cafeterias, TV studios, faculty and student locker and shower rooms, maintenance and repair shops, garages) which can be put to useful purposes in accomplishing the institution's mission.

D. Limitations: Deductions should not be made for necessary building columns and projections.

Figure 12. Assignable area



FIRST FLOOR



GROUND FLOOR

3. NONASSIGNABLE AREA: That portion of the building area not available for assignment to building occupants, but necessary for general operation. By definition, nonassignable area consists exclusively of: circulation, custodial, mechanical, and structural areas.

3.1 CIRCULATION AREA:

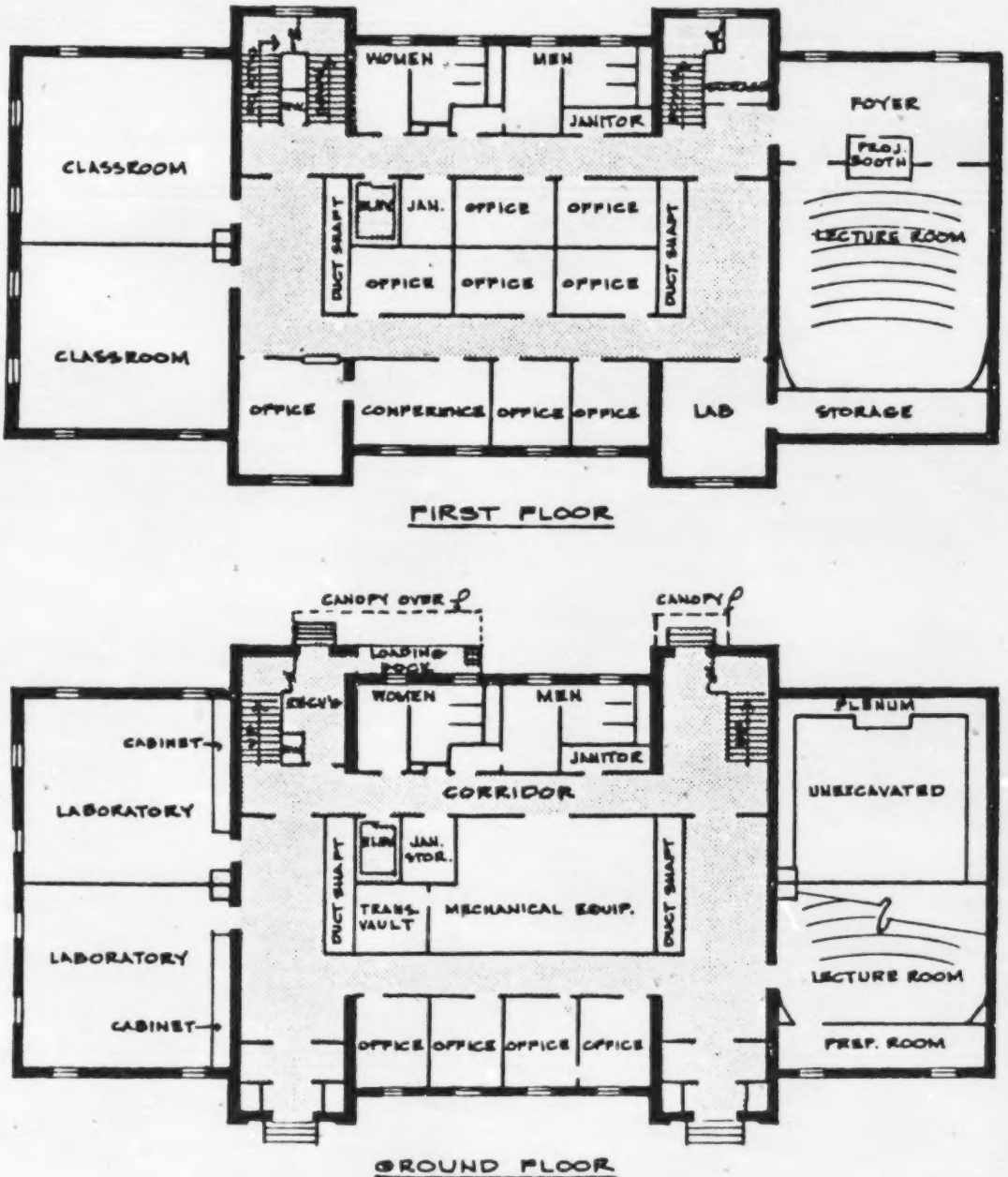
A. Definition: Required for physical access to some subdivision of space whether directly bounded by partitions or not.

B. Basis for Measurement: Should be computed by measuring from the inner faces of walls or partitions which enclose horizontal spaces used for such purposes. Deductions should not be made for necessary building columns and minor projections. Do not include unusable areas having less than 6'6" clear head room.

C. Description: Should include but not be limited to corridors, elevator shafts, escalators, fire towers, stairways, loading platforms, elevator lobbies, and tunnels and bridges.

D. Limitations: When determining corridor areas, only horizontal spaces required for general access should be included -- not aisles used only for circulation within office suites, auditoriums, or other working areas. Deductions should not be made for necessary building columns and projections.

Figure 13. Nonassignable area: Circulation area



A 141

3.2 CUSTODIAL AREA:

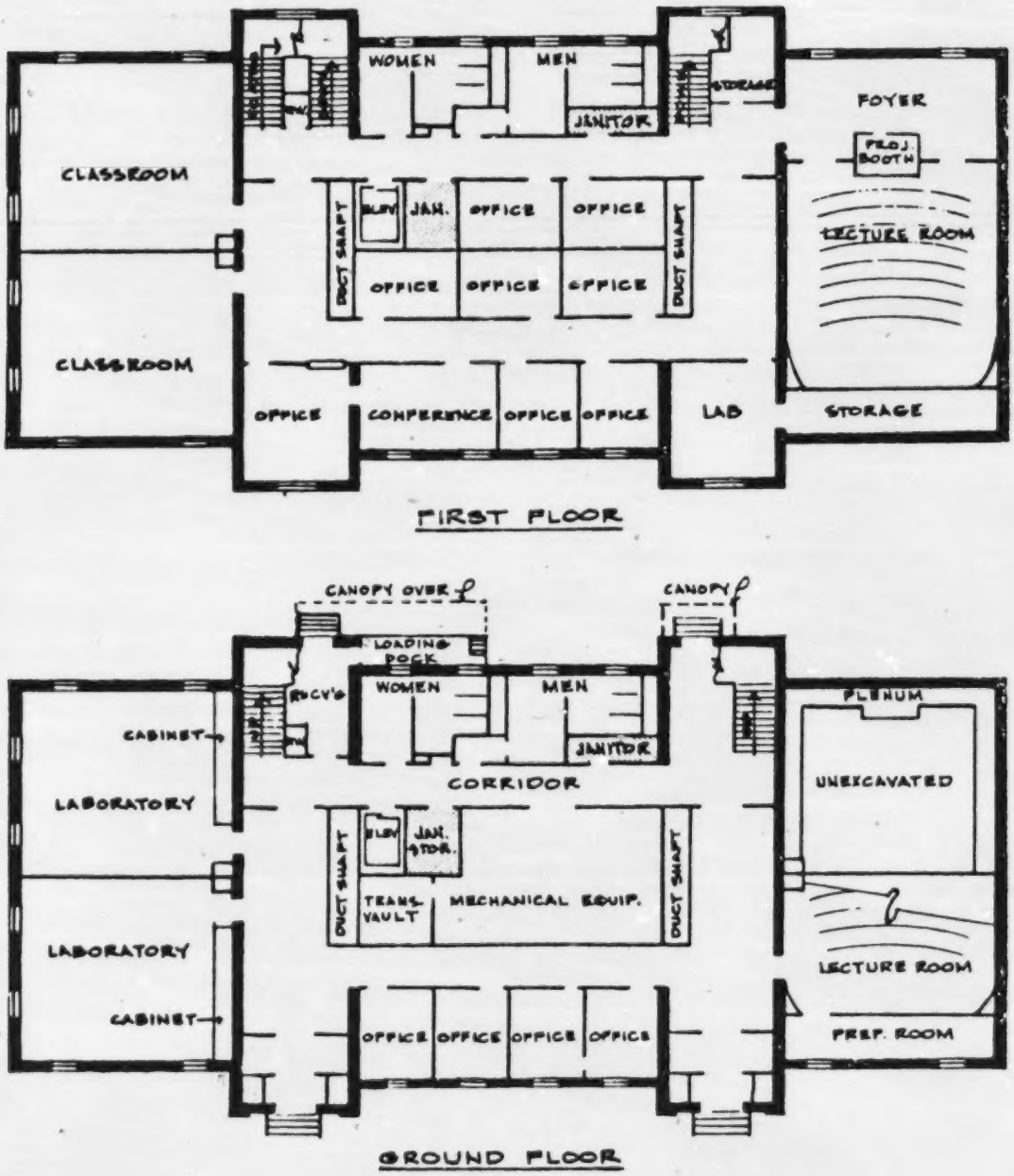
A. Definition: The sum of all areas of a building used for its protection, care, and maintenance.

B. Basis for Measurement: Should be measured from the inside surfaces of enclosing walls or permanent partitions. Deductions should not be made for necessary building columns and minor projections. Do not include unusable areas with less than 6'6" clear head room.

C. Description: Should include such areas as trashrooms, guardrooms, custodial rooms, custodial locker rooms, and custodial supply rooms.

D. Limitations: Should not include central physical-plant shop areas, nor special-purpose storage or maintenance rooms, such as linen closets and maid rooms in residence halls.

Figure 14. Nonassignable area: Custodial area



3.3 MECHANICAL AREA:

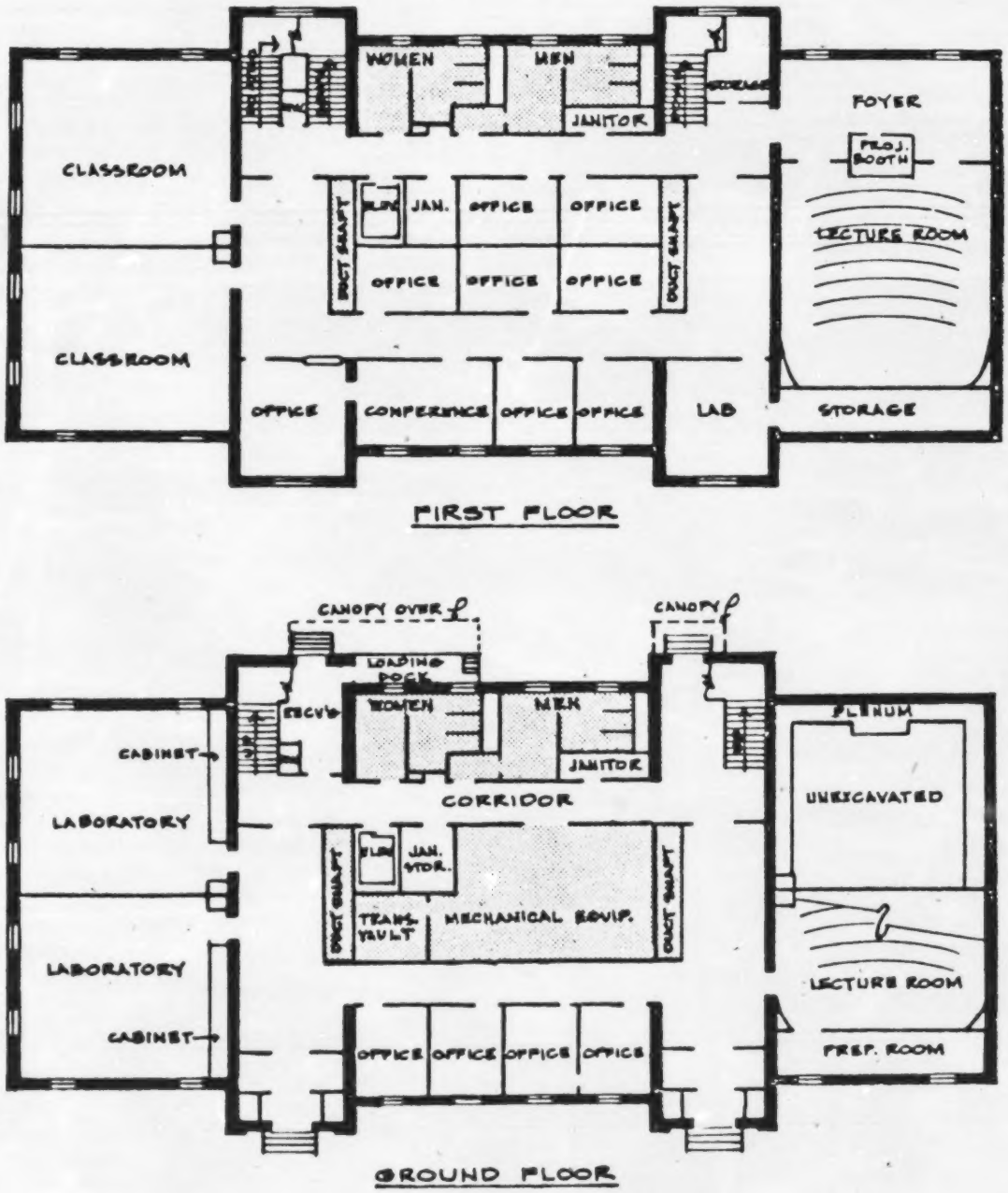
A. Definition: That portion of the gross area designed to house mechanical equipment, utility services, and nonprivate toilet facilities.

B. Basis for Measurement: Should be computed by measuring from the inner faces of the walls, partitions, or screens which enclose such areas. Do not include unusable areas with less than 6'6" clear head room.

C. Description: Should include, but not be limited to, mechanical areas in central utility plants, air-duct shafts, boiler rooms, fixed mechanical and electrical equipment rooms, fuel rooms, mechanical-service shafts, meter and communications closets, service chutes, stacks, and nonprivate toilet rooms (custodial and public).

D. Limitations: Deductions should not be made for necessary building columns and projections.

Figure 15. Nonassignable area: Mechanical area



3.4 STRUCTURAL AREA: 9/

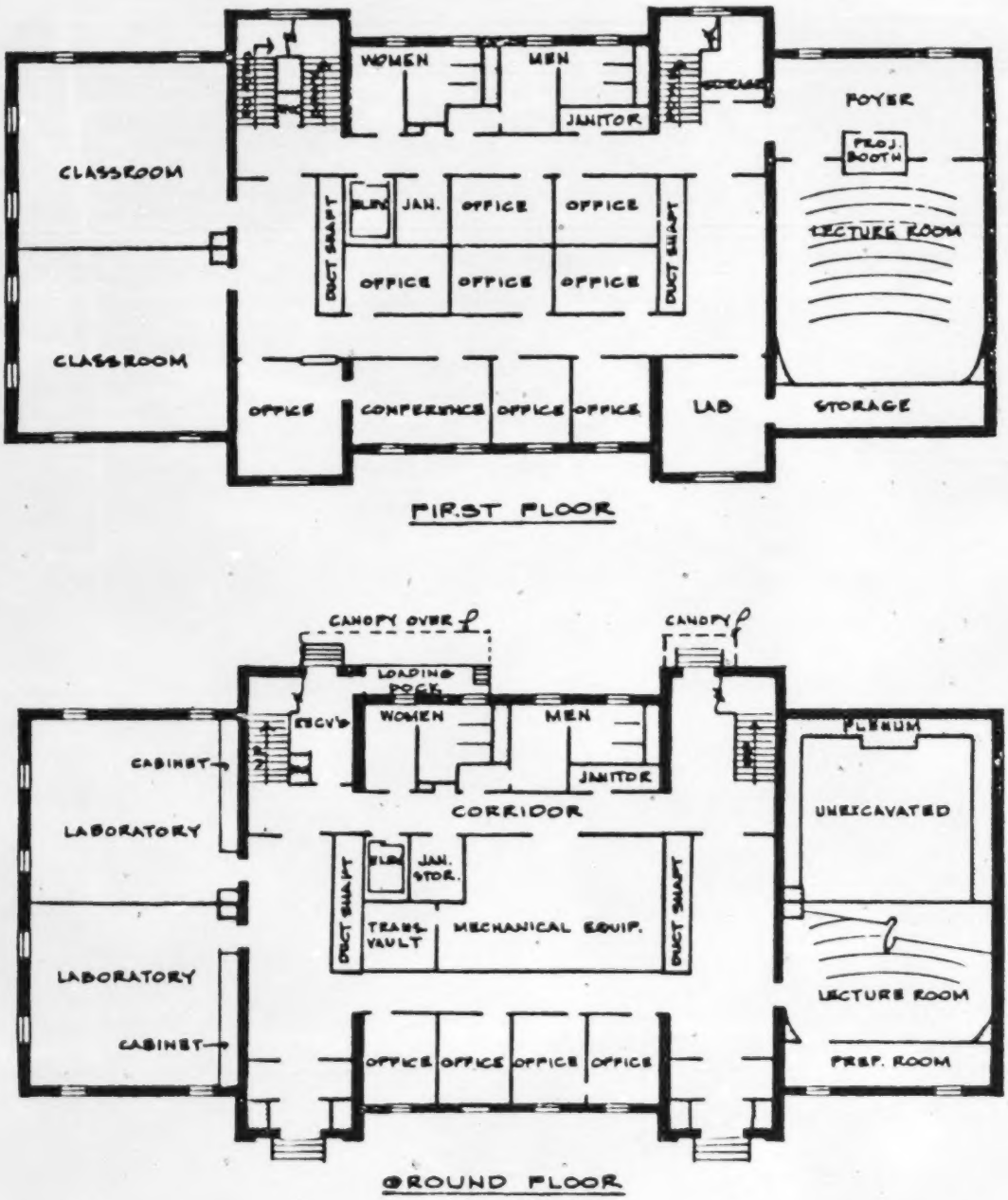
A. Definition: Should be construed to mean that portion of the gross area which cannot be occupied or put to use because of structural building features.

B. Basis for Measurement: Precise computation by direct measurement is not contemplated under these definitions. Should generally be determined by assuming it to be the residual area after the assignable, circulation, custodial, and mechanical areas have been subtracted from the gross area.

C. Description: Examples of building features normally classified as structural area are exterior walls, fire walls, permanent partitions, and unusable areas in attics, basements, or comparable portions of a building.

9/ Referred to as "construction area" in TR-50 (see footnote 8).

Figure 16. Nonassignable area: Structural area



Appendix

GLOSSARY OF TECHNICAL TERMS NOT ELSEWHERE DEFINED

1. BUILDING: A roofed structure for permanent or temporary shelter of persons, animals, plants, or equipment.

2. BUILDING DATA: Descriptive characteristics of a building, such as gross area, assignable area, condition, ownership, estimated replacement cost, and year of construction.

3. BUILDING INVENTORY: A statistical description of buildings, including both building and room data as defined below.

4. FACILITIES: Any physical structure or space required by the institution for the performance of its programs and related activities.

5. HEGIS: Higher Education General Information Survey conducted by the National Center for Education Statistics (NCES) in the U. S. Office of Education.

6. ORGANIZATIONAL UNIT: The basic component of the organizational structure of a college or university. Usually referred to as a department, but including both academic units (English Dept., Physics Dept., etc.) and administrative units (Office of the President, Registrar, Physical Plant, etc.).

7. PCS: Program Classification Structure developed by the National Center for Higher Education Management Systems (NCHEMS) at the Western Interstate Commission for Higher Education (WICHE) in Boulder, Colo.

8. PROGRAM: A set of activities which are collectively designed to achieve a well-defined objective or set of objectives within the institution.

9. PROGRAM CATEGORY: For this manual's purposes, a classification of similar or related activities by discipline area or major function.

10. ROOM DATA: Descriptive characteristics of assignable interior spaces of a building, including standard room-use categories, institutional organizational units, standard programs and program category codes, assignable floor areas, and (in some instances) numbers of stations.

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**Did not conduct an audit.
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APPENDIX F

Regional Distribution of States

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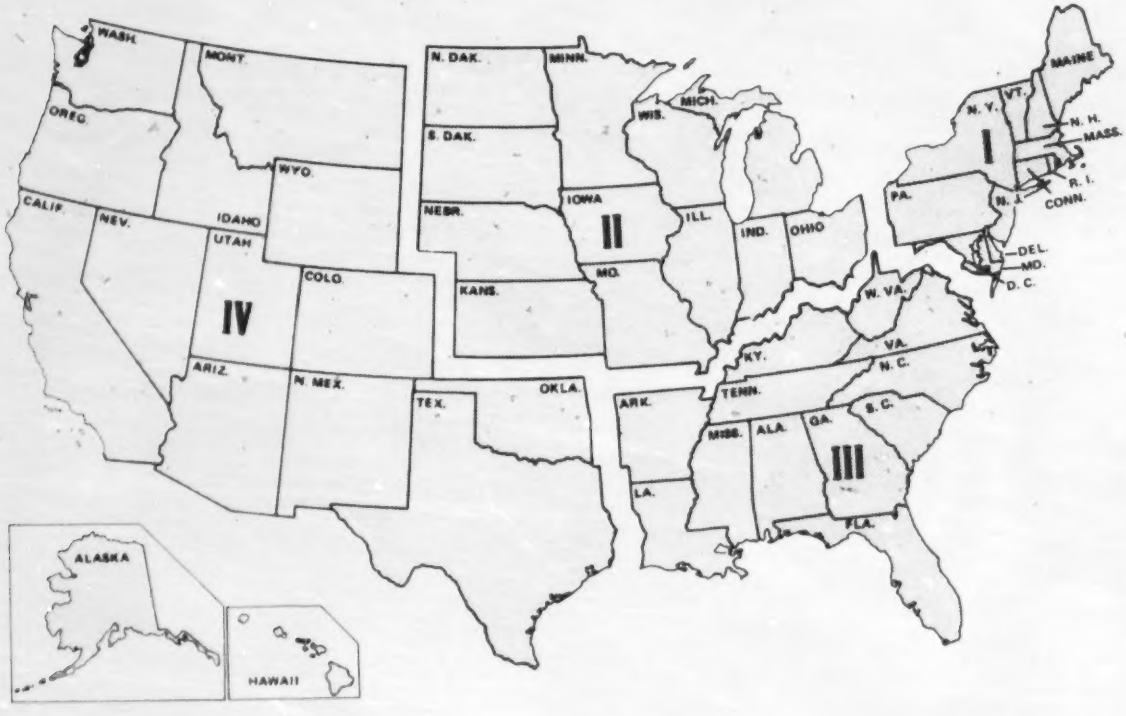
1. Connecticut
2. Delaware
3. District of Columbia
4. Maine
5. Maryland
6. Massachusetts
7. New Hampshire
8. New Jersey
9. New York
10. Pennsylvania
11. Rhode Island
12. Vermont

II. Great Lakes and Plains
1. Illinois
2. Indiana
3. Iowa
4. Kansas
5. Michigan
6. Minnesota
7. Missouri
8. Nebraska
9. North Dakota
10. Ohio
11. South Dakota
12. Wisconsin

III. Southeast
1. Alabama
2. Arkansas
3. Florida
4. Georgia
5. Kentucky
6. Louisiana
7. Mississippi
8. North Carolina
9. South Carolina
10. Tennessee
11. Virginia
12. West Virginia

IV. West and Southwest
1. Alaska
2. Arizona
3. California
4. Colorado
5. Hawaii
6. Idaho
7. Montana
8. Nevada
9. New Mexico
10. Oklahoma
11. Oregon
12. Texas
13. Utah
14. Washington
15. Wyoming



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